Mini Rider 2

User's Manual

Simuline®

BEFORE USING THE PRODUCT, PLEASE READ THE FOLLWING:

To ensure the safe installation and operation of the Mini Rider #2, please follow the instructions aimed at the users, operators and the person in charge of the installation. After careful reading and understanding the warning displays and cautions please operate Mini Rider #2 carefully. It is important to keep the service manual with the product or in a convenient place for future reference.

Herein, an explanation that requires special attention is enclosed with dual lines. Depending on the potentially hazardous degrees, the terms of DANGER, WARNING, CAUTION, etc. are used.
Try to understand the contents of the displays before the text.

Indicates that mishandling the product by disregarding this pictograph will cause severe injury or death.

Indicates that mishandling the product by disregarding this caution will cause a slight hazardous situation, which can result in personal injury and or material damage.

Indicates that mishandling the product by disregarding this warning will cause a potentially hazardous situation, which can result in death or serious injury.

For safe usage of this product, the following pictographs are used:

Indicates, “HANDLE WITH CARE.” In order to protect the human body and equipment, this display is attached to places where the User Manual should be referred.

Indicates a “Protective Earth Terminal.” Before operating the equipment, make sure the equipment is connected to the Earth Terminal (Ground Potential)
(This step may be omitted for products in which a power cord with earth wire is used.)

- **Perform work in accordance with the instructions herein stated.**

Instructions for the machine installation are explained by paying attention to the aspect of the accident prevention views. Failing to perform work as per the instructions can cause accidents. Only those who have technical expertise should perform the work to avoid hazardous situations, the instructions herein state that the electrically and electronically qualified servicemen should perform such work on Mini Rider #2, which is designed to performed electromechanical functions on a 3 DOF platform. (3 DOF = 3 x Degree of Freedom)

- **Mains Power must be switched OFF before working on the machine.**

To prevent any electric shock, please turn **OFF** the mains power before starting the maintenance work. If the work is to be performed during the power-on, then the qualified service engineer should follow the detailed technical & engineering Instructions from the Service Manual.

- **Make sure the Earth Terminal is at the Ground Potential** (this is not required where a power cord is build with an earth wire) This product is fitted with the Earth Terminal, therefore please connect that to the “indoor earth terminal” by using the earth wire which will avoid any electric shock. After performing repair of the Control equipment, ensure that the Earth Wire is firmly connected and measure the Earth Bond Resistance with your test meter and the readings must be recoreded.

- **It is important that the Power Supply used is fitted with an "Earth Leakage Breaker"**
  Mini Rider #2 **(MR #2)** does not incorporate the Earth Leakage Breaker.

- **Please use 20 Ampere "D" type MCB which will handle the surge current (Start up Current)**
  Refer to Page (7) for detailed information of "D" type MCB and why you must use 20A / "D" MCB
  Using standard fuses exceeding the specified rating can cause a fire and electric shock.

- **Specification changes by third party developers are NOT Allowed. Re-locating of the machinery parts with in MR #2, and carry out Conversions, Modifications of MR #2 with out the consent of Simuline are also not allowed.**
  All the moving and static parts of the MR #2 include warning labels for safety and designed related covers for personal protection, etc. It is very hazardous to operate the MR #2 by removing parts and or modifying the circuits. Should doors, lids and protective parts being damaged or lost, refrain from operating the product, and contact your MR #2 supplier or the nearest distributor immediately. Simuline shall not be held responsible for any accidents, compensation or damages to any third party, resulting from the specifications changes not designated by Simuline. This will also void the manufacturers Warranty.

- **Ensure that the product meets the requirements of appropriate Electrical Specification.**
  Before installing the product, check for Electrical Specifications. Simuline products have a nameplate on which Electrical Specifications are described. Ensure that the product is compatible with the power supply AC voltage and with the AC frequency requirements of the location. Using any Electrical Specifications different from the designated Specifications can cause a fire or an electric shock and this will void the manufacturers Warranty.

- **Install and operate the product in places where appropriate lighting is available, allowing warning labels to be clearly visible and understanding.**
  To ensure safety of the customers, labels and printed instructions describing potentially hazardous situation are applied to places where accidents can be caused. Make sure where MR #2 is operated has sufficient lighting allowing the warning labels are to be visible and read. If any labels have been peeled off, please apply them again immediately. It is important to place an order for warning labels etc with the machine supplier or with the nearest MR #2 distributor.

- **Servicing the Game Display Monitor.**
  Display monitor (TV) parts are subject to (EHT) Extra High-Tension Voltage. Even, when the Power is "OFF" some of the components are still accumulating voltage until the highly charged capacitors are fully discharged. Therefore, only a **Monitor Service Engineer** should perform the repairs and parts replacement, failing these procedures will void the manufacturers Warranty.

- **Make sure the Monitor Adjustments are carried out, as per display service manual.**
  Do not operate the product with "On-Screen" flickering or with colour blurring.
  Using with-out proper adjustments may cause dizziness to the game players, or to the customers.

- **When transporting or re-selling MR #2, the service manuals must accompany the product.**
  In case, commercially available equipments such as printers have been used with MR #2, then it is important to keep all the service manuals together to help the next purchaser or the third party operator to install the MR #2 with out any problems.

・ Description herein contained may be subject to improvement changes without notice.
・ The contents described herein are full prepared with due care. However, should any question arise or errors can be found, please contact Simuline.

INSPECTIONS IMMEDIATELY AFTER TRANSPORTING THE PRODUCT TO THE LOCATION.

Normally, at the time of shipment, Simuline products are in a status allowing for usage immediately after transporting to the location. Nevertheless an irregular situation may occur during transportation. Before turning on the power, check the following points to ensure that the product has been transported in a satisfactory status.

- Are there any dented portions or defects (cuts, etc.) on the external surfaces of the cabinet?
- Are the Casters and Adjusters damaged?
- Does the power supply voltage and frequency requirement meet with those of the location?
- Are all wiring connectors correctly and securely connected? Unless connected in the correct direction, connector connections can not be made accurately. Do not insert connectors forcibly.
- The fuses used meet specified rating? Is the Circuit Protector in an energized status?
- Are all accessories available?
- Can all Doors and Lids be opened with the Accessory keys? Can Doors and Lids firmly close?

□ TABLE OF CONTENTS □

■ BEFORE USING THE PRODUCT, BE SURE TO READ THE FOLLOWING

1. HANDLING CAUTION 5

2. INSTALLATION LOCATION CAUTION.....8

3. CAUTIONS:OPERATION 10

4. SPECIFICATION 14

5. NAME OF THE PARTS.....15
   5-1. MAIN BODY 15
   5-2.SCU (SYSTEM CONSOLE UNIT) - FRONT.....16
   5-3. SCU (SYSTEM CONSOLE UNIT) – BACK 17
   5-4. MCU (MOTION CONTROL UNIT).....17
   5-3. O.P PANEL 18

6. ACCESSORY 19

7. INSTALLING THE FENCE..... ..19

8. INSTALLATION ASSEMBLY.....20

9. PRECAUTION OF MOVING SYSTEM AT THE LOCATION 40
10. DESCRIPTION OF SAFETY DEVICES 41

11. DESCRIPTION OF RIDES.....42

12. RIDE OPERATION INSTRUCTION.....43

13. SYSTEM ON 44
   13-1. System On (POWER ON)).....44
   13-2. System Off (Power OFF) 44
   13-3. Emergency Situation.....45

14. Monitor 46

15. Area Sensor 48

16. Grease up 49
   16-1. Actuator Grease Up 50
   16-2. UNIVERSAL JOINT IN THE ACTUATOR.....50
   16-3. Grease Up of Middle Joint 51

17. Maintenance 52
   17-1. PERIODIC INSPECTION..... 52

18. TROUBLE SHOOTING 54
   18-1. TROUBLESHOOTING TABLE……54
   18-2. MCU ERROR……54

1. HANDLING CAUTIONS

When installing, maintaining or handling the product, the following cautions should be observed in order to enjoy the game safely.
Failure to follow the warnings listed below and in other parts of this manual may cause physical injuries or damage to the machine.

- Before any installation or maintenance work, make sure to turn off the power. Failure to do so may cause an electric shock or short-circuit. In case it is necessary to keep the power on for a certain type of work, the manual will explicitly state so.
- Do not suddenly pull out or insert the power plug from / into an outlet. It may cause an electric shock or short-circuit.
- Do not attempt to touch any plug with wet hands. It may cause an accident due to electric shock.
- Power cables / cords or grounding wires should not be exposed such as on a passage. The exposure may cause physical injuries, possibly resulting in short-circuit or electric shock.
- Do not place any article on power cables / cords nor damage them, for it may cause a fire or electric shock.
- Do not pull on the power cables / cords unnecessarily during or after installation. Damaged cords may cause a fire or electric shock.
- If any power cord is damaged, ask the manufacturer / supplier for a replacement power cord. Using a damaged power cord can result a fire, electric shock or electric current leakage.
- Make sure to earth the product. Incorrect grounding may also cause an electric shock.
- Use the rated fuse only. Using any fuse of incorrect rating may cause a fire or electric shock.
- Firmly connect IC boards and all connectors completely. Unstable connections may cause an electric fire.
- Do not make any unauthorized changes or modifications to the product.
  - Doing so may cause fire or an electric shock. In some cases it can hurt and cause physical injury to the user / operator.
  - The manufacturer / distributor will not be liable for any accidents that occur on products that have undergone unauthorized modifications or changes performed by a third party.
- Make sure to always execute the routine maintenance procedures specified in the manual.

- When cleaning the “Surface of the Monitor” (Glass / TFT/ LCD / Plasma) use a soft and dry cloth. Do not use chemicals such as thinner or benzene.
- Static electricity can destroy electronic parts on IC boards. Make sure to discharge any static electricity by measures such as setting hands to a grounded metal plate before handling IC boards.
- There are some components / parts, which are not specially designed and manufactured for the product. Please understand that in case the manufacturer of such components / parts discontinues production or changes the specifications, it may not be possible to repair or replace such products regardless of the warranted period.

STICKER LABELS

The Mini Rider #2 contains sticker and labels stating the product’s Serial Number (S/N) and electrical specifications. When you request a repair done or have any inquiries with regard to spare parts, check your S/N first, before you contact the manufacturer or the machine distributor. The S/N is the identification number of each product. Same models may have different parts used depending on the production time. Also models may be improved after the manual is issued. To deal with each case effectively, it is necessary to supply the unique **Serial Number** of the Equipment.

WARNING LABELS

All Simuline products have stickers and labels to warn the users, of their safety and any possible danger situations. Also the warning labels are fitted to avoid any possible accidents while operating or maintenance work is carried out. When machine needs servicing please set up a warning sign to warn the players and the general public. Specially, a qualified electrical & electronic engineer should carry out the necessary maintenance work. Anyone, who will not follow the warning sings, will not be allowed to carry out the engineering work or other maintenance duties.

"D" type MCB @ 20 Amp - Single Pole circuit breaker

MCBs or 'Miniature Circuit Breakers' are intended to give protection against overloads and short circuits, which can cause damage to cables and equipment.

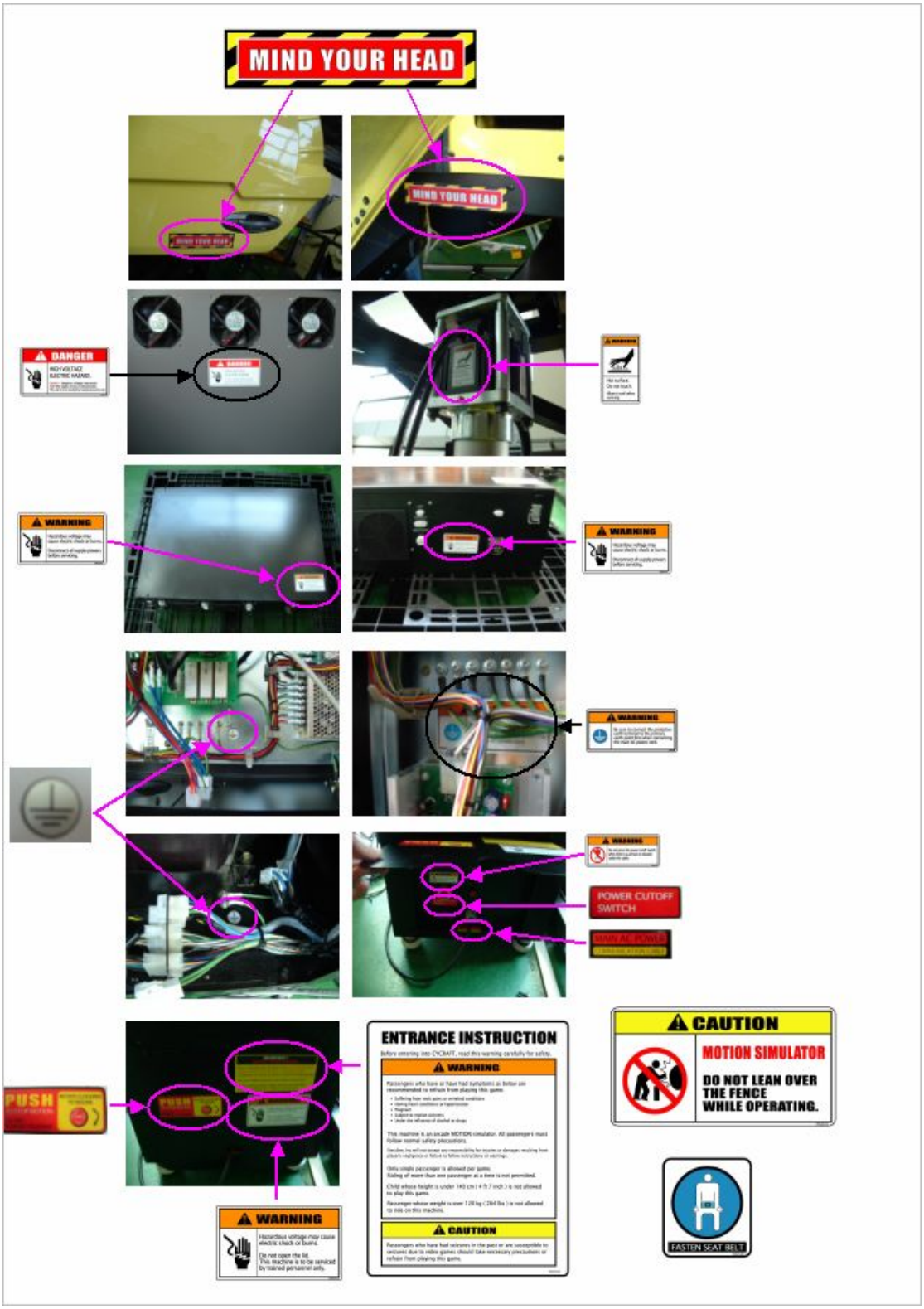
Industrial Range "D" type MCBs detect over currents due to both overload and fault currents. The MCB will operate and interrupt the supply to prevent damage to the installation.

www.tlc-direct.co.uk/Products/CM9020D.html

For valuable information, please click the above Link.

The Electrical Power Consumption of Mini Rider 2

1. Start up current (Start – up "Peak Current") : 19.8 amp = **5 K Watts**
2. Running current: 10amp. = **3 K Watts**
3. Single phase supply voltage : 200 ~ 240 volts


MIND YOUR HEAD
MIND YOUR HEAD
DANGER
WARNING
WARNING
WARNING
POWER CUTOFF SWITCH
PUSH
WARNING
ENTRANCE INSTRUCTION
WARNING
CAUTION
CAUTION
MOTION SIMULATOR
DO NOT LEAN OVER THE FENCE WHILE OPERATING.
FASTEN SEAT BELT

2. INSTALLATION LOCATION CAUTIONS

The product is intended for indoor use. Therefore, do not install it outdoors.
Even when installed indoors, the following locations should be avoided. They may cause a fire, electric shock or breakdown.

- Places with raindrops or water leakage, or places with high humidity & damp such as indoor swimming pools or showers.
- Places that have a high temperature such as places with direct sunlight or close to heating sources.
- Places near flammable gas, explosive chemical or dangerous substances.
- Places that are dusty
- Places with an incline.
- Places with intense vibration
- Places near anti-disaster facilities such as emergency exit or fire extinguisher
- Any other place outside of the allowable temperature range (ambient temp.) of 5 □~30□.

RESTRICTIONS FOR USE

- Check your electric specifications.
  Check whether the product conforms to the voltage, current and frequency provided at the installation location. For the electric specifications, see the plate (label) attached on the product.
  If electric source outside of the specification is used, it can cause a fire or electric shock.
- Inside the installation location, a breaker and an earth connection for the product are required. An independent electric source for the product should be provided to prevent fire or electric shock.
- Make sure to use the power cable in accordance with power consumption as described below. Using power cable of other electric specifications can cause a fire or electric shock.
- Make sure to use the power with independent circuit breaker. Using any power source without circuit breaker can cause a fire.
- Do not have many electrical cords connected to a single socket. Overload can cause the generation of heat or a fire.
- If an extension cord is used, it should be rated the max current or higher as described below. Using a cord of different specifications can cause a fire or electric shock.

Please refer to page (7) “D” type MCB information and
The Electrical Power Consumption of Mini Rider 2

OPERATIONAL FLOOR AREA

- For proper operation, a floor area of **3700mm X 2500mm** or more is required. In case of interference with the motion of the cabin.
- Ventilation area specified in this manual should be secured. In addition, obstacles should not block ventilation vents and ports. Blocked ventilation may cause the generation of heat or a fire.
- In case any accident occurs while the product is operated on a floor area less than specified, the manufacturer will not be responsible for any damages and liability.
- In case the product cannot fit through the entrance of a location, do not disassemble without proper preparations. Disassemble only the parts, as specified in this manual. Do not attempt a disassembly procedure not described in this manual. Special tools and adjustment procedures are required to disassemble / assemble much of the mechanical parts of the product. Improper disassemble / assemble can lead to accidents such as electrical shock and human injury. If the product does not fit through the entrance even after the disassembly specified in this manual, then contact the manufacturer or the distributor of the product or the contact provided in this manual.
- Do not tilt the product or subassemblies in an attempt to pass through small entrances. This can cause accidents during the transportation. In addition, it can cause damage or deformation to parts and result in accidents during operation.

To fit the product in a location, the size of the entrance should be, at least, **1300mm** wide and **1550mm** high.

3. CAUTIONS: OPERATION

For safe operation, please obey the following warnings and instructions.

CAUTIONS: OPERATION

Check the following cautions before working hours to prevent accidents.

- To prevent any player or other customers from headache or dizziness, the product should be installed in a well-lighted place so that warning signs are clearly visible. Improper lighting can cause unexpected problems such as contact between customers, collision, and other undesirable situations.
- Adjust the monitor appropriately.
  If monitor blinking is detected, do not leave it un-adjusted. Inappropriate monitor adjustment can cause dizziness or headache to players.
- Prepare a resting facility for players to take a rest in case he (she) needs to rest due to conditions such as motion sickness.
- Check whether the level adjusters are securely set to the ground. If not, the product is not properly set and can result in an accident.
- Do not place any heavy article on the product. It can cause an accident if dropped and can also damage components.
- Do not climb on the product. Accident can be caused from falling. If it is necessary to check the top of the product, use a stepladder.
- Check whether any doors or cover sections are damaged or separated. It can cause electric shock.
- Do not place the following articles on or inside the control panel, on top of the seat, on the top of the product or in the vicinity of the product. Doing so may cause short-circuit, electric shock or damages to machine parts.
  Vases, pots, cups, water containers, cosmetics and containers full with chemicals, water bottles, soft drink cans, take away food packages etc…
- Check the surroundings before turning the product on. Once it is turned on, the product is automatically initialized. If any person is too near to the product during initialization, possible collision can occur during the moving of the cabin.
- For safe operation, make sure to execute a trial operation after power is on. Since the cabin moves, the product is equipped with safety devices. Please check whether these safety devices are working normally as follows.
  - Does the seat belt is fitted and secured by the player?
  - Does the seat belt is free of damages or excessive wear?
  - Does the motion stop automatically when the seat belt is loosened / taken off?
  - Does the seat belt is attached securely without looseness?
  - Does the machine stop when the STOP button is pressed?
  - Does the machine stop when the front / side beam sensors are tripped?
  - Does the machine stop when the floor beam sensor is tripped?
- In addition to checking the safety devices, make sure that the product moves normally. Any abnormal motion can cause accidents. Do not operate the product unless all abnormalities are resolved.
  - Does the machine move in sync with steering wheel operation?
  - Does the machine move smoothly?
  - Does the machine move securely without looseness?
  - Is there any abnormal noise or sound when moving?
  - Is there any abnormal vibration when moving?
  - Does the product return to the initial standby position and stop when the game is completed?

- If any abnormality in the motion system is suspected, immediately stop all operations, turn off the product and disconnect the power cord. Then, call your machine distributor or the contact point listed in this manual. If the product is operated abnormally, serious accidents such as electric shock, fire, collision can occur.
- For the proper maintenance of the motion system, please call the contact point listed in this manual. If improperly trained personnel perform the maintenance work, it is possible that accidents can occur during the maintenance work and that can cause accidents to customers and players. This will void the manufacturers Warranty.

- To help prevent accidents, make sure to install the auxiliary fence and ensure that the product operates properly within the fenced area. Failure to secure sufficient floor space with the fence can result in accidents due to collision and contact between players and objects.
- Make sure there is no damage to surfaces that the player touches during play. Such damaged surfaces can cause cuts and injury.

CAUTIONS : OPERATION (PLAYER CONDITIONS)

To prevent accidents and / or unnecessary problems, alert players or customers to be aware of the following.

● Anyone who falls into one or more of the following categories should be prevented from playing the game. It may cause an accident or injuries.
  ▪ Persons who need assistance when walking, and persons with high blood pressure or heart disease.
  ▪ Persons who have experienced spasms / convulsions or unconsciousness' after playing a TV video or similar game.
  ▪ Persons who have neck or back trouble.
  ▪ Pregnant women or persons who are intoxicated..
  ▪ Persons susceptible to vomiting from amusement rides.
  ▪ Persons that do not follow warning signs.
● Even persons who have never experienced discomfort due to phobic stimulation may experience dizziness, nausea, and / or headaches from playing this game.
● If discomfort becomes severe, advice a player to consult a doctor.
● Do not place any heavy articles or beverages on top of the product. Accidents from the falling articles and accidents due to electric shock can occur.
● Do not insert your finger or any foreign substances into any open parts or doors of the product. It may cause electric shock or short-circuit.
● Do not lean on or climb on the product. It may cause accidents from falling and turnover of the product.
● Do not pull out the power plug recklessly. It may cause short-circuit or electric shock.

● For safety reasons, persons shorter than 140cm (55.11 in.) are not permitted to play this game. Please explain that such persons cannot be safely secured with the provided safety belt.

● Persons whose weight is over 120kg (265lbs.) are not permitted to board.
● Playing without the seat belt fastened can cause an accident by falling from the cabin. Make sure the player secures their body with the seat belt before playing the game
●. No one should hang on the cabin behind the seat. This can cause serious injury due to falling, jamming of body parts between structures, and turnover of the product. If anyone is found hanging on to the cabin, make sure the person gets off immediately.

● . Make sure the game is not played with a child sitting on the players lap. Serious injury can result due to the child being jammed between the player and the control panel, or the child falling from the moving cabin.

● Nobody except the players should approach the product during play. Injury resulting from collision and contact with moving parts can occur.
The safety sensor senses foreign substances on top of the base only. In particular, since small children cannot anticipate the potential danger, make sure that they are properly attended to near the product.

● Ensure that player's feet are always inside the cabin and on the pedals. Feet that are carelessly hung out or protruded from the cabin can be caught due to cabin motion and serious injury such as fracturing can occur.

● Prevent potential accidents or problems by disallowing play with bags, mufflers, and other items strapped on the players' necks, entering the cabin with drinks, and other player actions that are potentially dangerous.

● If any abnormal or dangerous situation with the player is observed, stop the motion of the product by pressing the "Motion Stop" button.

● Do not handle the product recklessly such as by hitting or kicking it.
Such behavior can cause turnover of the product and material damage and may result in injuries.

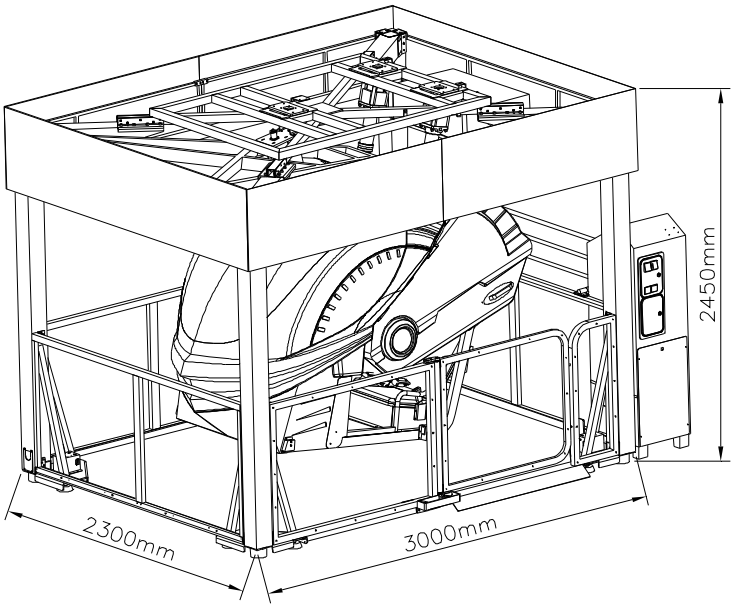
● When getting on the cabin, there is the danger of players tripping on the base and hitting his/her head on steel structures of the product. Please make sure players get on the product carefully.

● Ensure that nobody except the player touches or activates the ride and other controls of the ride during play. It can cause injury due to collision between persons or with moving parts of the product. It can also cause trouble between the customers.

● Please alert players not to place any articles or baggage on the base floor of the product. If the floor beam sensor does not detect them for some reason and keeps operating, the items can be dispersed and/or projected and cause accidents to bystanders.

● Before playing the game, have the player adjust the seat suitable for his/her individual physical size. Playing the game in an unnatural position can cause unexpected accidents.

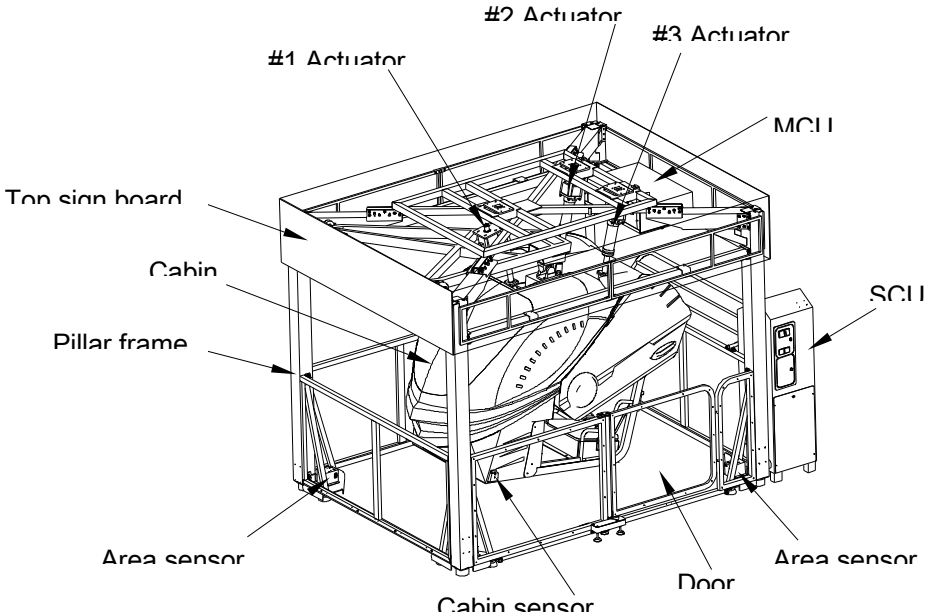
4. Specification



- Diamentions : 2300mm (W) x 3000mm (L) x 2450mm (H)
- Weight: approx. 1200Kg
- Power: Single Phase 230 volts AC @ 11A (during normal game operation)
- Power Consumption: approx. 3Kw (during normal game operation)
- Monitor: 42”
- Weight Limit: 240kg for two passengers

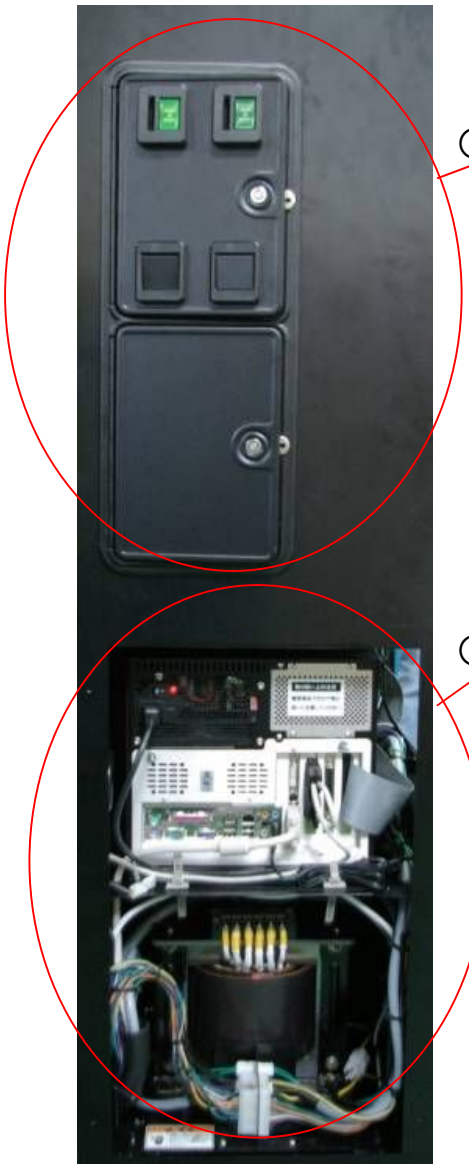
5. Name of the parts

5-1. Main Body



Item	Description
Motion Actuator Mechanism	Motion Driving Actuators and anti-twist structure made of links.
MCU (Motor Controller Unit)	Controllers that drive the actuators. 3 units.
SCU (System Console Unit)	Contains system control, movie control unit and coin tower.
Area Sensor	Area sensors that detect any obstacles. When triggered, motion stops until the obstacles are removed and resumes after 3 sec.
Door	Door for riders. (one side)
Cabin Sensor	Cabin sensors that detect any obstacles. When triggered, motion stops until the obstacles are removed and resumes after 3 sec
Pillar Frame	Structure that hold up the motion system and MCU.
Cabin	Semi-enclosed cabin with seats for 2.
Top Sign Board	Sign Board

5-2. SCU (System Console Unit) - Front



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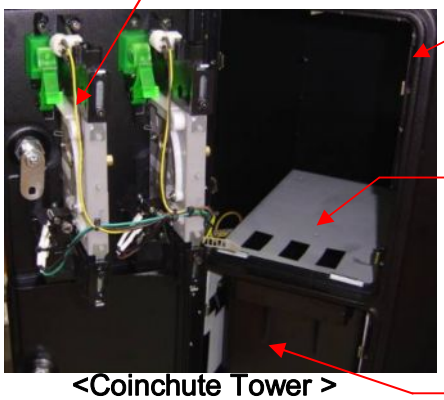

<Coinchute Tower >

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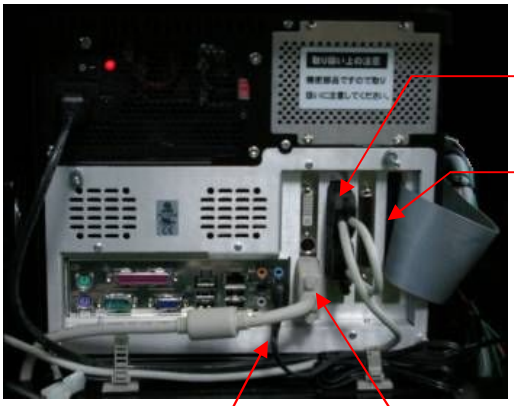

<System Control Computer>

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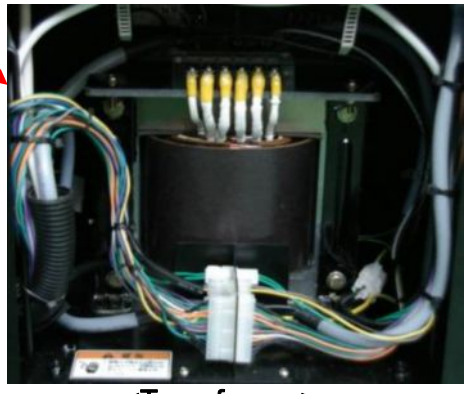
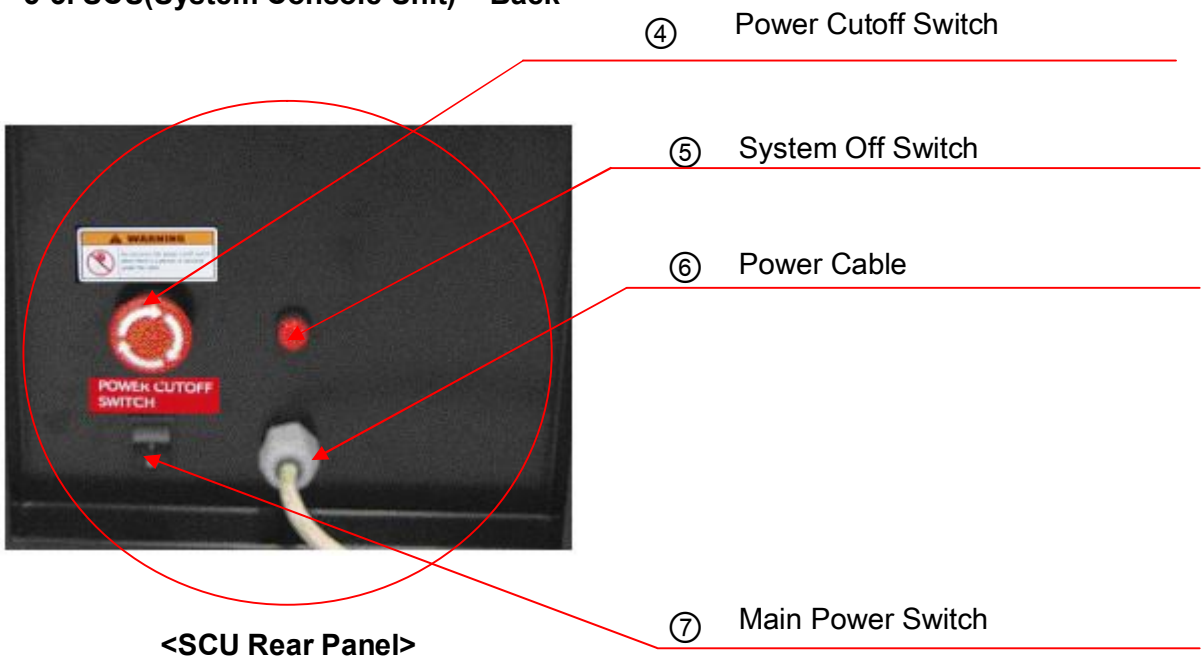


<SCU Front Panel>

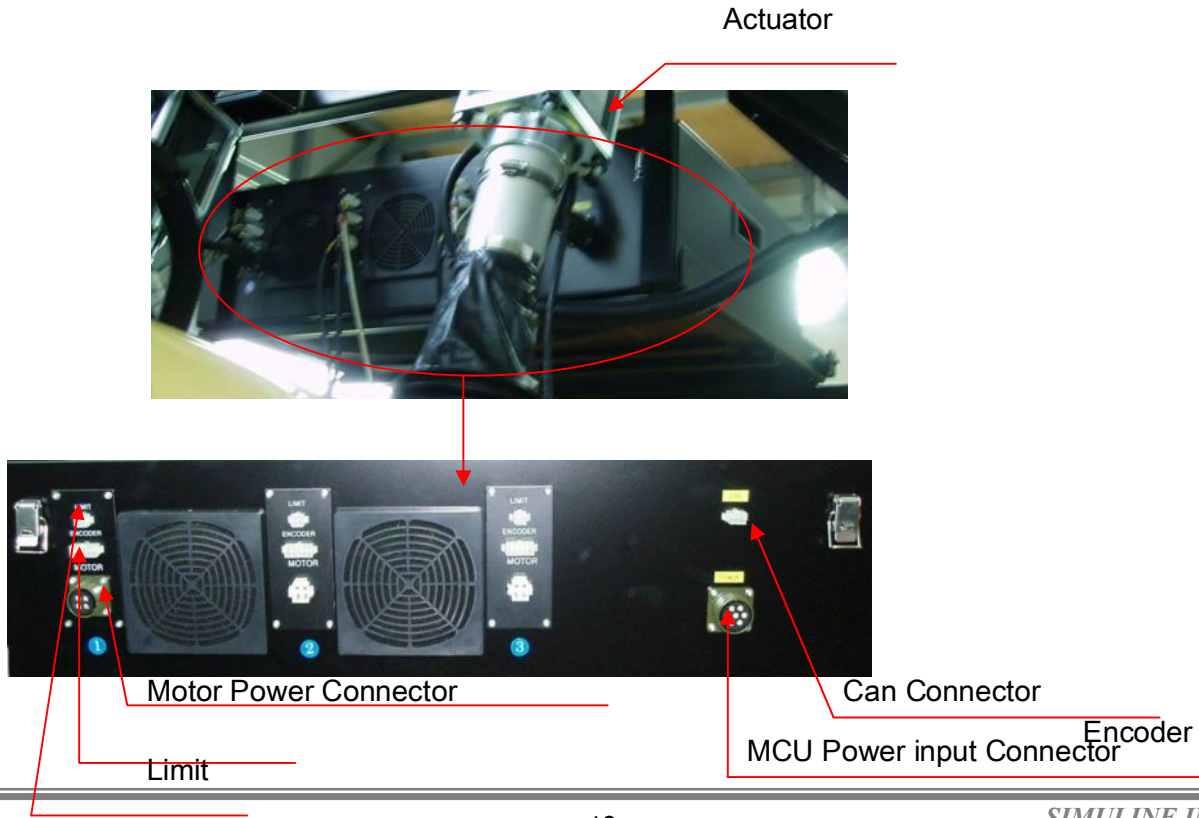
<Transformer>

5-3. SCU(System Console Unit) – Back



<SCU Rear Panel>

5-4. MCU (Motion Control Unit)

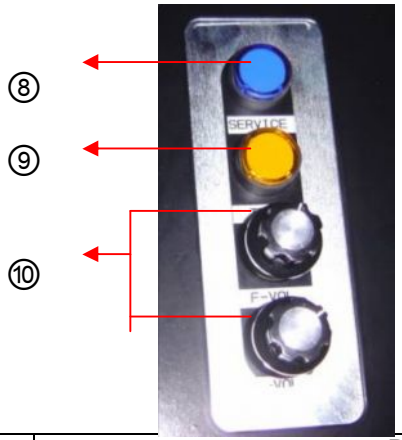


< MCU>

	Item	Description
1	Coin chute Tower	Coin Selector, Coin Vault, Cash box
2	System Control PC	Computer that controls the hardware and everything that operates the machine.
3	Transformer	Adjusts the voltage according to the country.
4	Power Cutoff Switch	Only used to stop the machine even when the Emergency stop button is pressed and doesn't work. When pressed, the power to the MCU and the Actuators. Cabin stops at the last position and comes down to power off position slowly. Do not force the cabin to come down faster. "Warning" DO NOT PRESS THIS BUTTON EXCEPT FOR EMERGENCY.
5	System OFF	When pressed for 2 sec., cabin will come down to the initial position and the power to MCU is cut off. System control PC will shut down.
6	Power Cable	Main Power cable.
7	Main Power Switch	When pushed to ON position, system starts up. Initialization will be processed. Cabin moves up to boarding position.

5-5. O.P Panel

O.P Panel is located inside the Coin chute Tower of the SCU.



	Item	Description
8	SVC (Service)	Inputs the credit.
9	TEST Mode button	Used to update the operating software or to do service works. Also used to diagnose conditions of the System Control Computer. To use this mode, press and hold the button while turning on the system. This button will not work while in operation. "CAUTION" Only the certified service man shall use this mode.
10	F-VOL	Front speaker volume
	R-VOL	Rear speaker volume

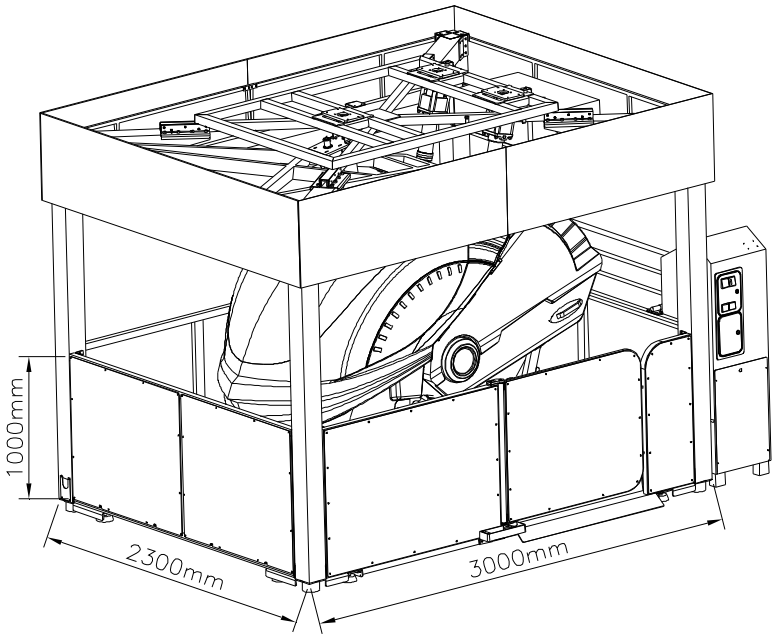
6. Accessory

Part	Number
SCU Key	2
Coin chute Tower Key	2
Manual	1

7. Installing the Fence

- **Mini-Rider is a motion simulator. Rectangular fence must be installed before operating.**

■ Install the door at the entrance.



Size	2300mm x 3000mm x 1000mm

Material, Installation	Fence is equipped with strong PC (polycarbonate) screen to keep the gallery away from the moving cabin. Fence must be securely fastened to the main frame with supplied bolts.
Ex.	

8. Installation Assembly

- **Always follow the instructions in this manual. Not following this manual fully may cause electric shocks or other accidents.**
- **This product has a complex structures and equipments. Misses in assembly may cause electric shock or damages to the machine and cannot guarantee normal operation in those cases.**
- **Make sure there are a crew of 4 or more is available for installation. One technician cannot assemble this machine. If one person carries out the installation, accidents or damages to the machine may occur.**
- **Make sure all of the connectors are connected to the proper positions firmly. Insecure connections may cause malfunctions or electric shocks.**
- **Make sure that none of the cables and harnesses are damaged during installation. Damaged cables and harnesses can cause electric shocks or short circuit.**
- **The manager of the store or the service manager must carry out this installation. If unqualified personnel install this machine, accidents may occur. Also, if the installation instructions in this manual are not followed fully, severe accidents may occur to both of the passengers and workers.**
- **Make sure that the required space is available for the installation. The space required for the installation is noted in this manual. Insufficient installation space may cause accidents during installation.**
- **Slanted floor, gaps, elevation difference must be avoided for installation. Cabin or frames may tip over and causes sever accidents.**
- **Do not expose the power cable, earth line and etc where people might walk over them. Damaged cables may cause electric shocks or short circuits. Use cable floor molds to protect them.**
- **Do not cover the vent at SCU. It may cause overheating and possibly fire.**
  Make sure there are at least 2m of room in front of the door for traffic.

- **Use caution while working with molded parts. Too much pressure can damage the parts. This may cause injuries.**
- **Be careful when working with doors to avoid head injuries.**

Follow the below order when installing the product.

(1) Line up all the parts

(2) Settle the Pillar frame in position

(3) Assemble the Pillar frame and upper support frame

(4) Assemble the Pillar frame and lower support frame

(5) Assemble the Pillar frame and X-frame (=actuator support frame)

(6) Assemble the Pillar frame and Arm frame

(7) Connect Actuators to the X-frame

(8) Assemble the Cabin

(9) Assemble the MCU support bracket

(10) Assemble the Side Fence

(11) Assemble the Door Fence and Door box

(12) Assemble the Area Sensor and Sensor Setting

(13) Fasten SCU

(14) Assemble Top Sign Board

(15) Assemble the ramp

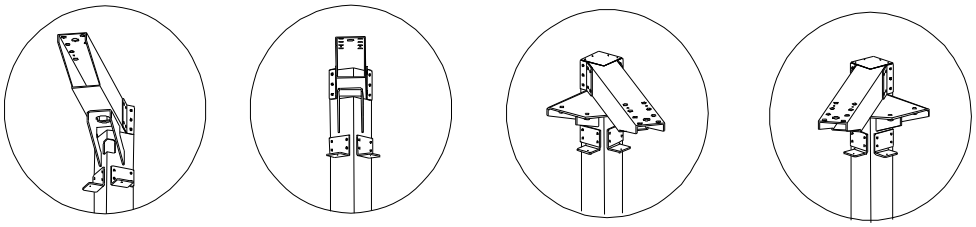
 Install the Casters – Option

(1) Line up all the parts

(2) Settle the Pillar frame in position

 Be sure to leave at least 2m of room in front of the door to provide enough room for traffic.

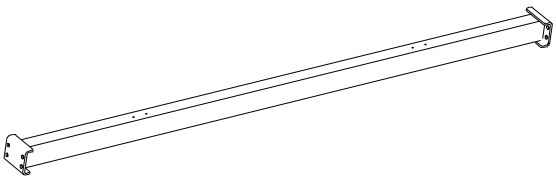
 #1 Pillar frame has a cable duct inside.
 #3 and #4 has holes for Arm bearing bracket.



< Fig 8-2a >

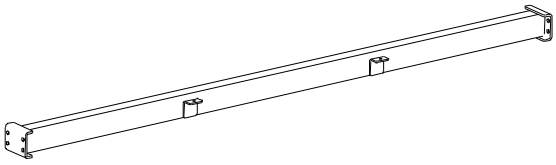
(3) Assemble the Pillar frame to support frame

□ Support frame has 4 tap holes for Top signboard.



< Fig 8-3a >

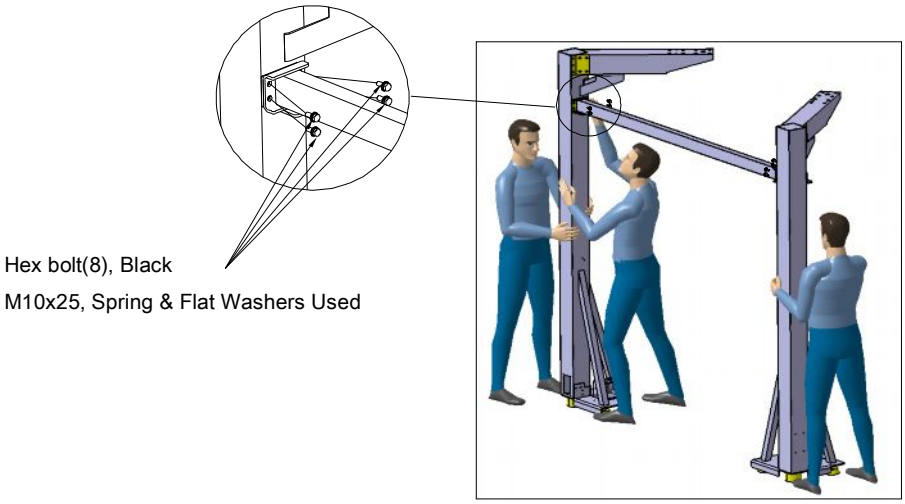
① #2 Support frame has 4 tap holes for Top sign board.



< Fig 8-3b >

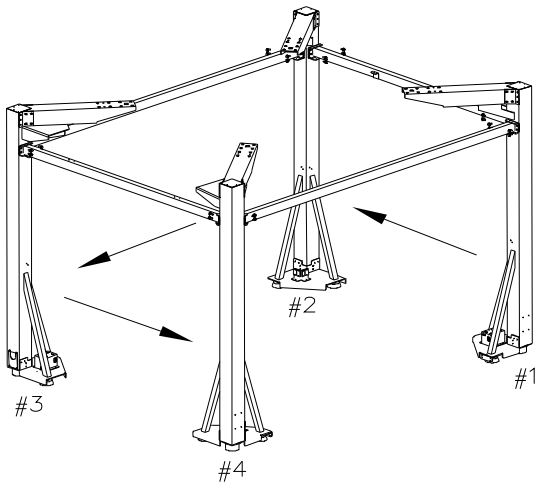
② A little twist and push may be needed to line up the Bolt holes.
(Use Locktite 242 or a product of same performance to fasten the bolts.)

Caution ! : When a pillar frame is standing alone, it may tip over. One should always hold the frame upright when others are tightening the bolts.



< Fig 8-3c >

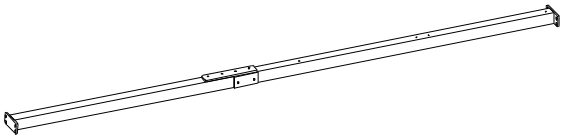
③ Top Support frame is assembled in the order of #1~#4.



< Fig 8-3d >

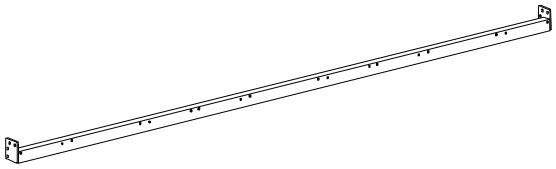
(4) Assemble the Pillar frame and lower Support frame

① Door support frame has 4 tap holes for Door box and Fence.



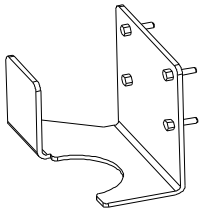
< Fig 8-4a >

② Fence support frame has 5 tap holes for the Fence.

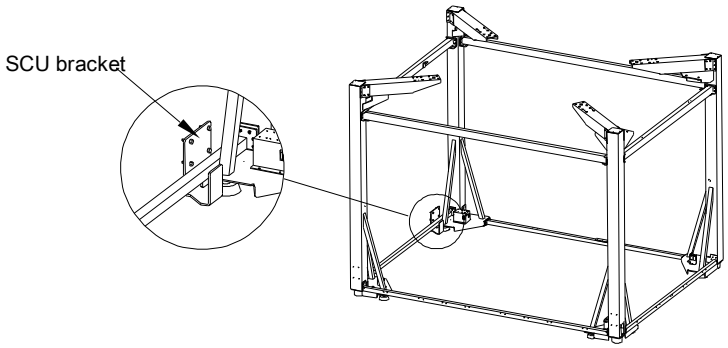


< Fig 8-4b >

③ Push the SCU bracket under the Fence support frame.

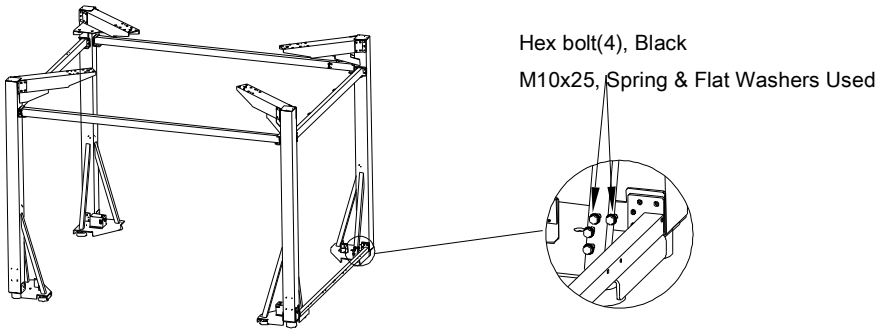


< Fig 8-4c. SCU bracket>

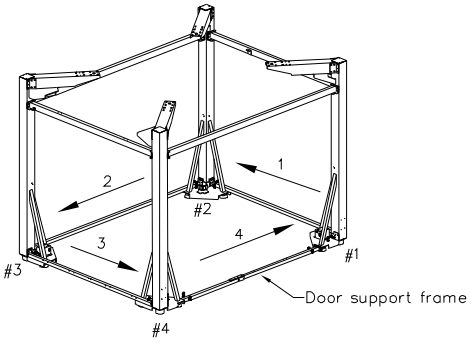


< Fig 8-4d. SCU bracket>

④ After assembling #1~#4 Fence support frame, Assemble the Door support Frame.
(Door support frame needs to be disassembled when installing the cabin. Do not apply Locktite)
Pillars may need to be pushed and twisted to line up the bolt holes.



< Fig 8-4e>



< Fig 8-4f >

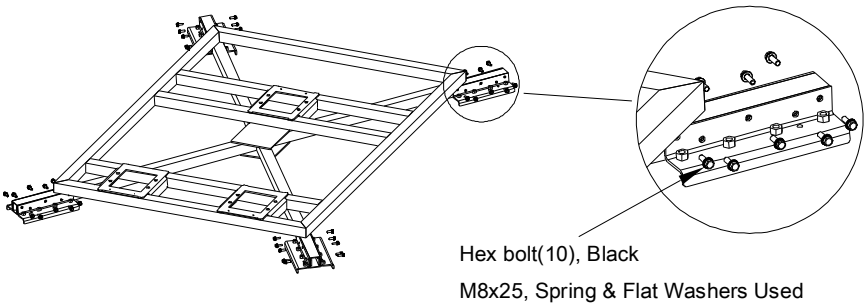
(5) Pillar frame and X- frame (=actuator support frame)

- Before installing the X-frame on top of the Pillar frame, prepare 8 plate washer and assembly bracket.

Plate washer Assembly bracket

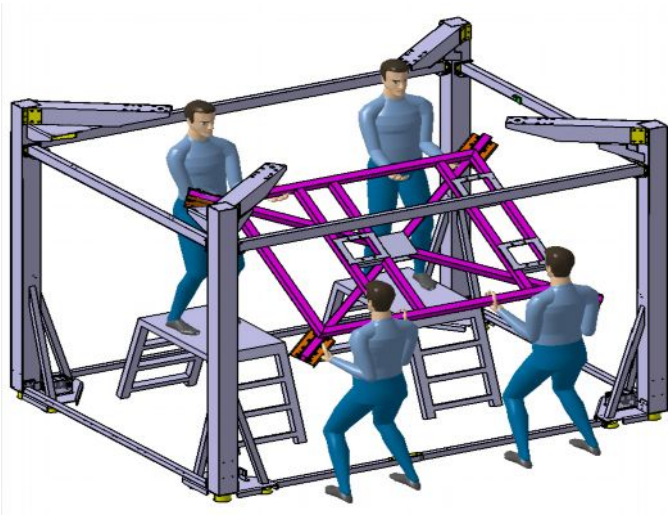
< Fig 8-5a >

- Attach the bracket to the X-frame.



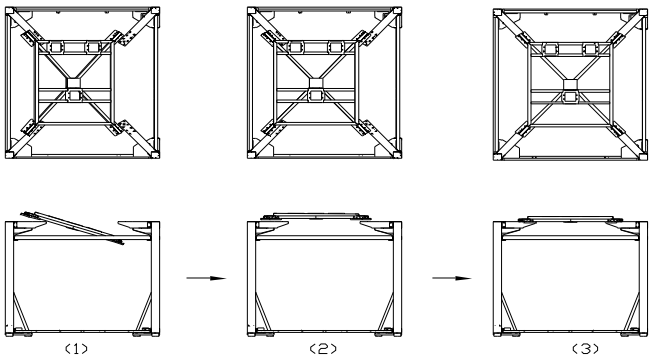
< Fig 8-5b >

 Prepare 2 scaffolds and have 2 of the technicians on the top as shown.
 2 on the scaffolds lifts and 2 on the floor push up the X-frame and put the X-frame on the top of the pillar frames.



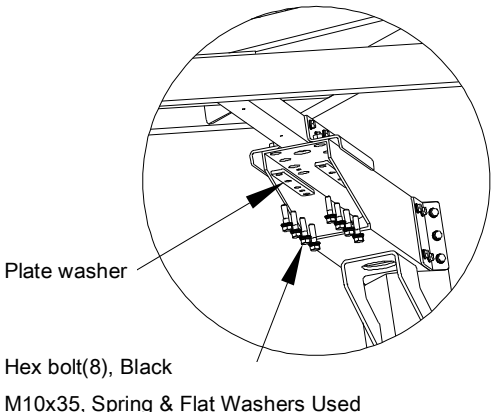
< Fig 8-5c >

 Move the X-frame carefully to line up the bolt holes.
 Tip : Pillar frame may need to be pushed or twisted to line up the bolt holes.



< Fig 8-5d >

 When the boltholes are lined up, use plate washers to assemble the X-frame for temporarily.



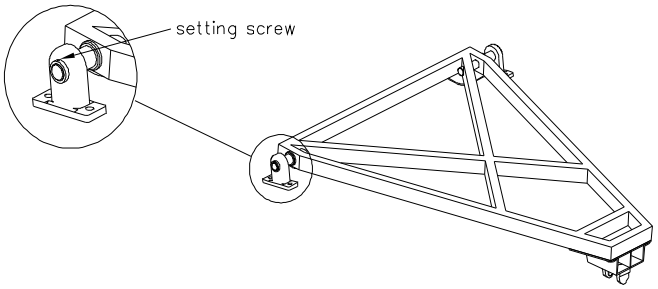
< Fig 8-5e >

- When all the bolts are in position temporarily, tighten the bolts at the Upper support frames first.

- Tighten the bolts in the following order.
  : Upper support frame -> Lower support frame -> X-frame bracket ->
  X-frame bracket and Pillar frame

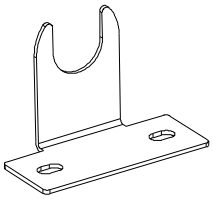
(6) Pillar frame and Arm frame

- Make sure the set screws on the Arm frame are securely tightened.
  (if not bearings may move out of their positions.)



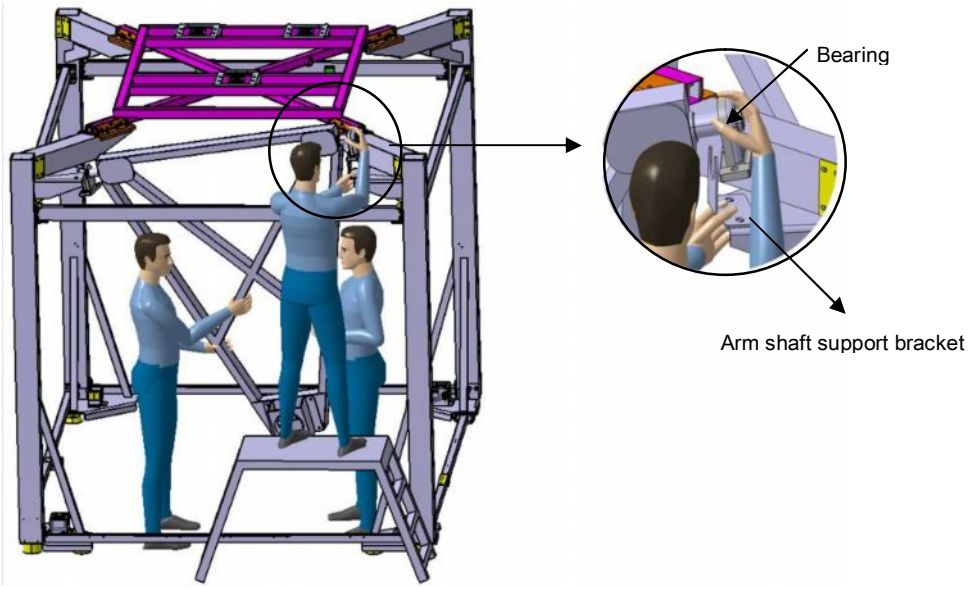
< Fig 8-6a. Bearings on the Arm frame>

- Prepare Arm shaft support bracket.



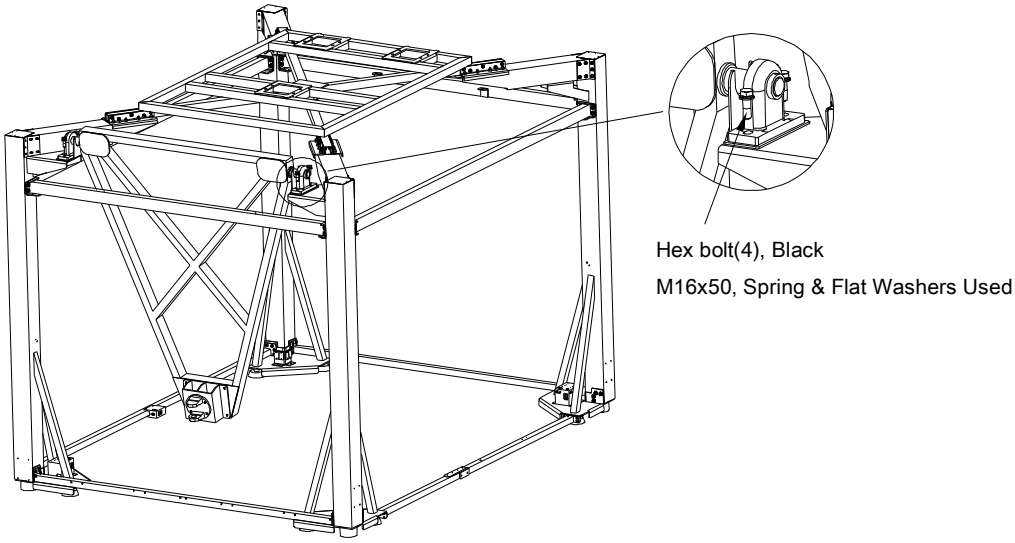
< Fig 8-6b. Arm shaft support bracket >

- 2 x technicians hold the arm frame straight up with the bearings on the top.
- 1 x technician places the bearing lining up with the mounting holes.
- before tightening the bolts, place the Arm shaft support bracket between the bearings and the frame.
- Ref.: When the Bearing is not already attached to the Arm frame, refer to Fig 8-6a and attach the bearing to the arm frame.



< Fig 8-6c>

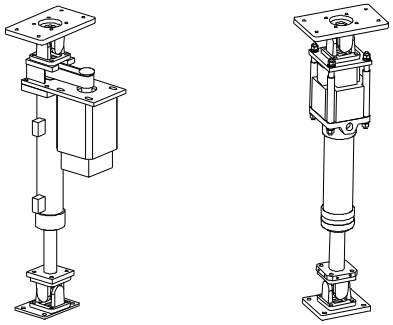
 Tighten the bolts after lining up the holes. Use Locktite 242.



< Fig 8-6d>

(7) Attaching the actuators to the X-frame

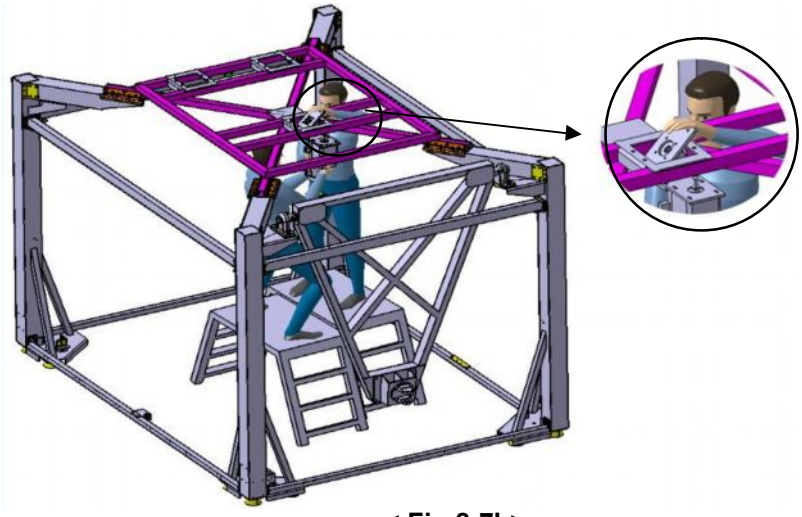
 There are total of 3 actuators. The one with belt drive system is the #1 actuator, and the rest are #2 and #3.



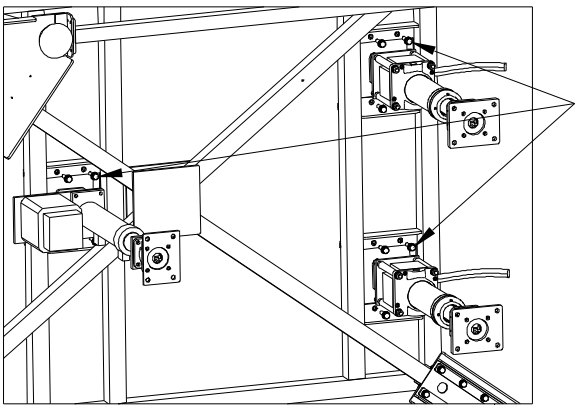
#1 actuator #2,3 actuator

< Fig 8-7a>

- With one technician holding an actuator in place, and the other moves the bracket so that the actuator hangs from the X-frame. Line up the mounting holes and secure the actuator with supplied bolts.

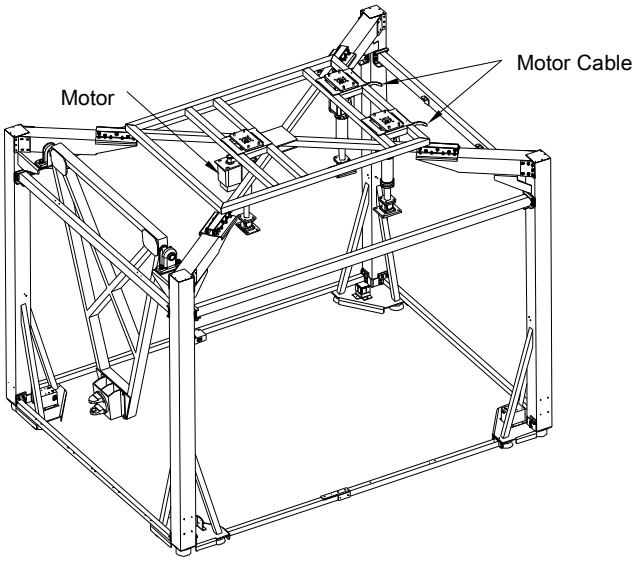


< Fig 8-7b>



< Fig 8-7c>

- Make sure the motor is facing outside when installing #1 actuator.
- Mount the actuators so the cables are facing outward when installing # 2 and # 3 Actuators.

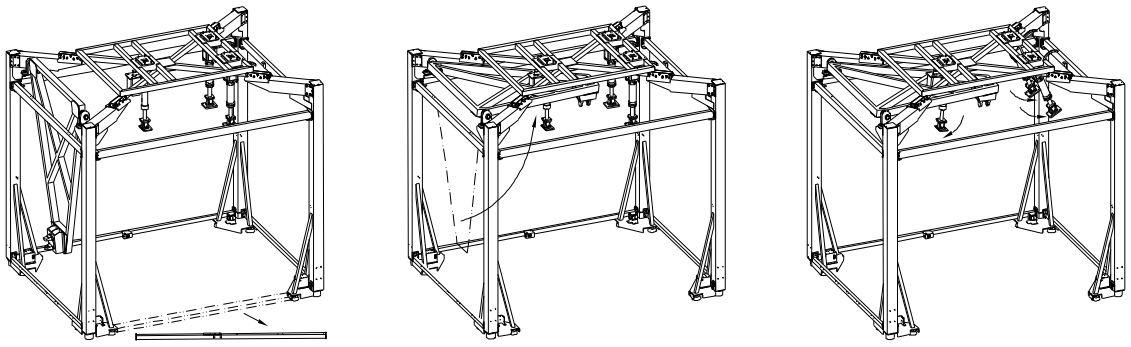


< Fig 8-7d>

(8) Attaching the Cabin

 First, remove the door support frame.
 Lift the Arm frame.

  Tip : Use a ratchet rope or similar equipment to hold it up.
 Secure the actuators so that they do not interfere with the cabin.

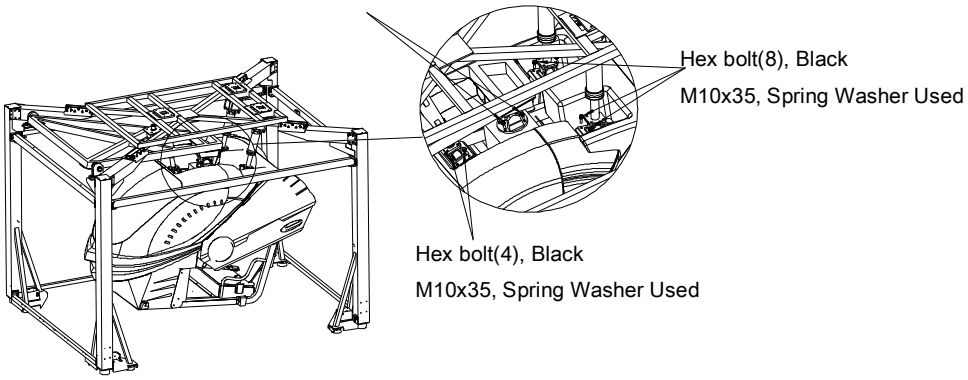


< Fig 8-8a>

 After removing the cabin from the package, check for any signs of damage to the cabin FRP. Check for any loose bolts and screws. Check if any of the cables are missing. Using a pallet truck, move the cabin in to the frame so that the cabin is placed right below the X-frame.
 Line up the mounting holes of the middle universal joint and the holes on the cabin. Line up the holes for the actuators and the according holes on the cabin. Tighten the bolts.

Hex bolt(4), Black

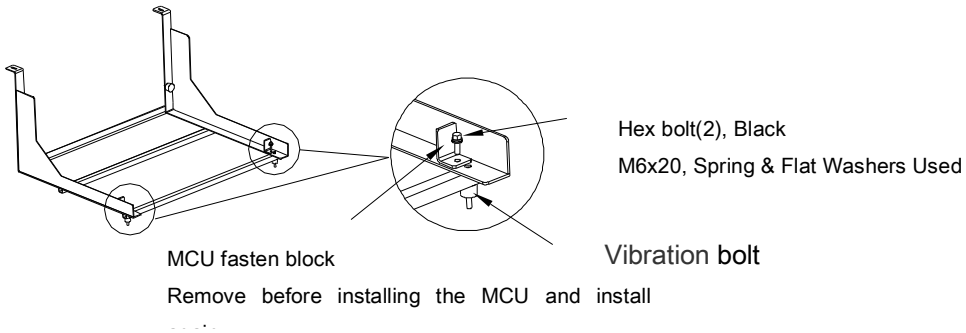
M12x35, Spring Washer Used



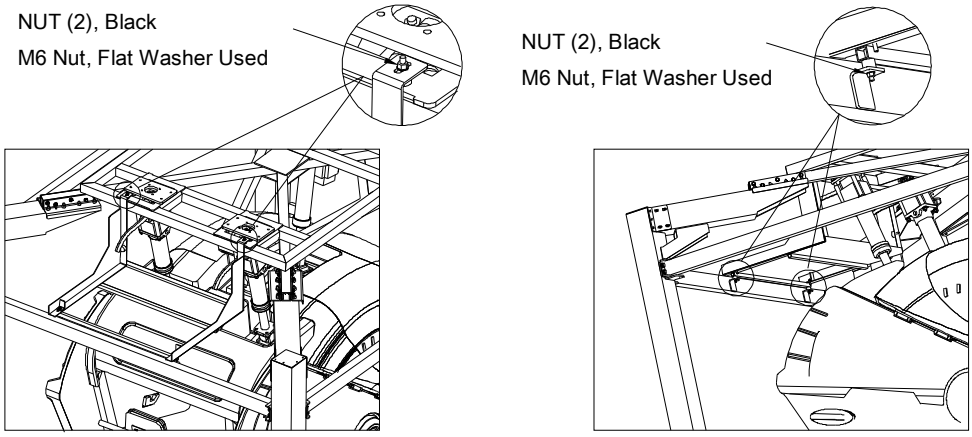
< Fig 8-8b>

(9) MCU Support Bracket

 Mount the MCU Support Bracket on the already mounted floating bolts on the X-frame. There are also floating bolts on the on the upper Support frame. Tighten both sides.


Hex bolt(2), Black
M6x20, Spring & Flat Washers Used
MCU fasten block
Remove before installing the MCU and install
Vibration bolt

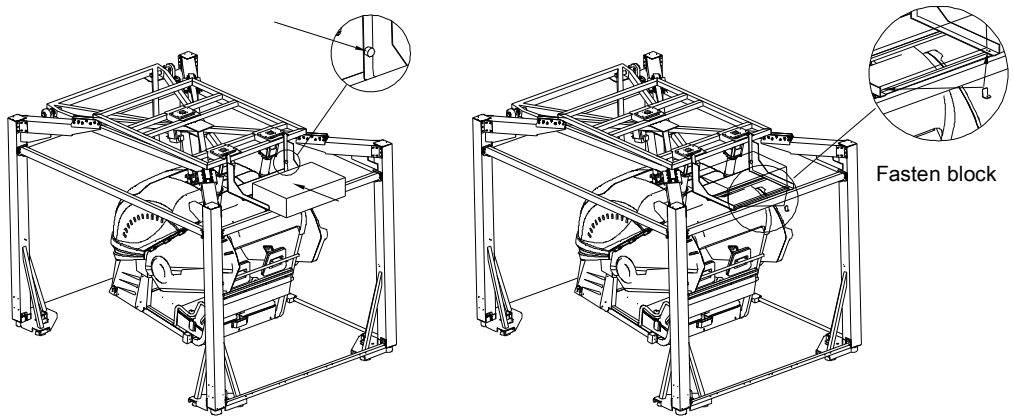
< Fig 8-9a. MCU Support Bracket>



< Fig 8-9b>

 After installing MCU Support Bracket, place the MCU box and push it until it is stopped by the stopper. Install the Fasten blocks that were once uninstalled.

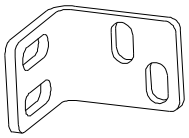
Stopper



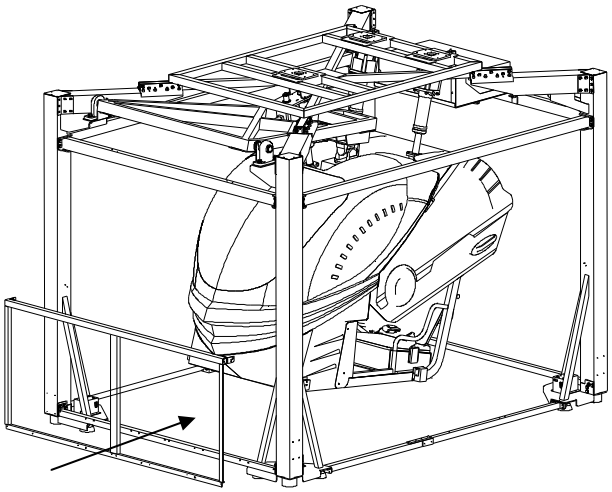
< Fig 8-9c>

(10) Side Fence

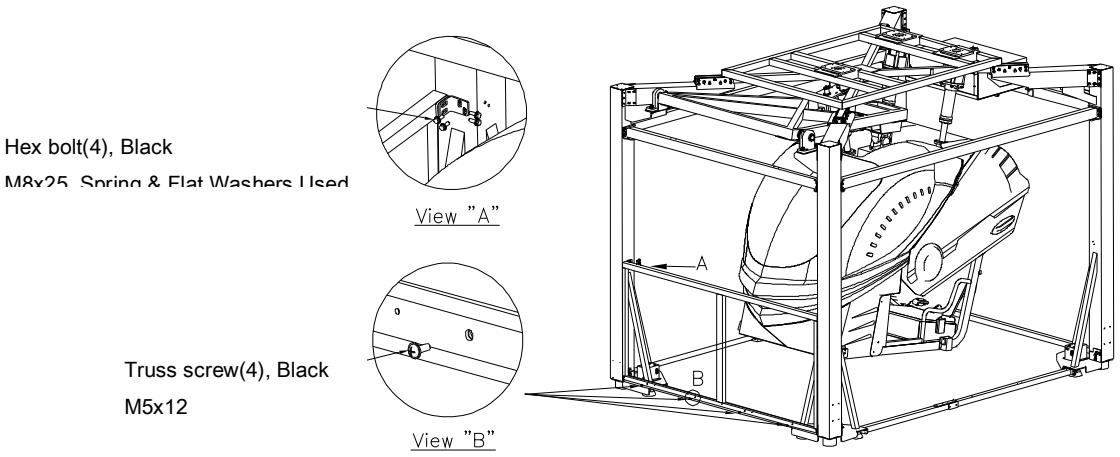
- Re-install the Door Support Frame.
- Except for the fence on the door side, place the other fences at the corresponding positions.
- Attach the Fence bracket on the Pillar frame에 Fence temporarily.
- Line up the bolt holes on the Lower Support Frame and fasten the bolts.
- Attach the fence to the Pillar frame.



< Fig 8-10a. Fence bracket >

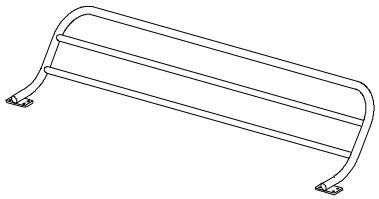


< Fig 8-10b>

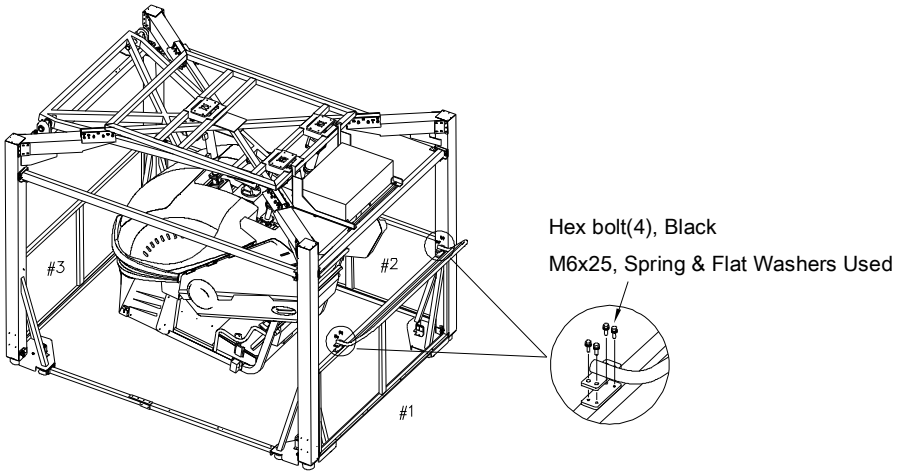


< Fig 8-10c>

□ After installing the Fence, attach the fence protector to the #1 fence(back of the cabin.)



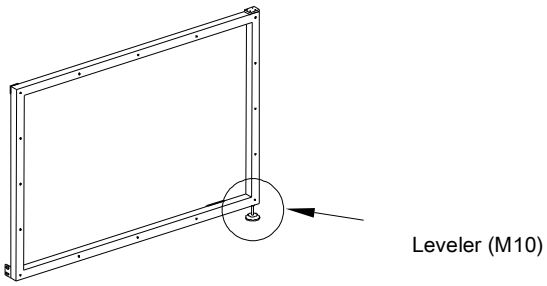
< Fig 8-10d. Fence protector >



< Fig 8-10e. Fence protector>

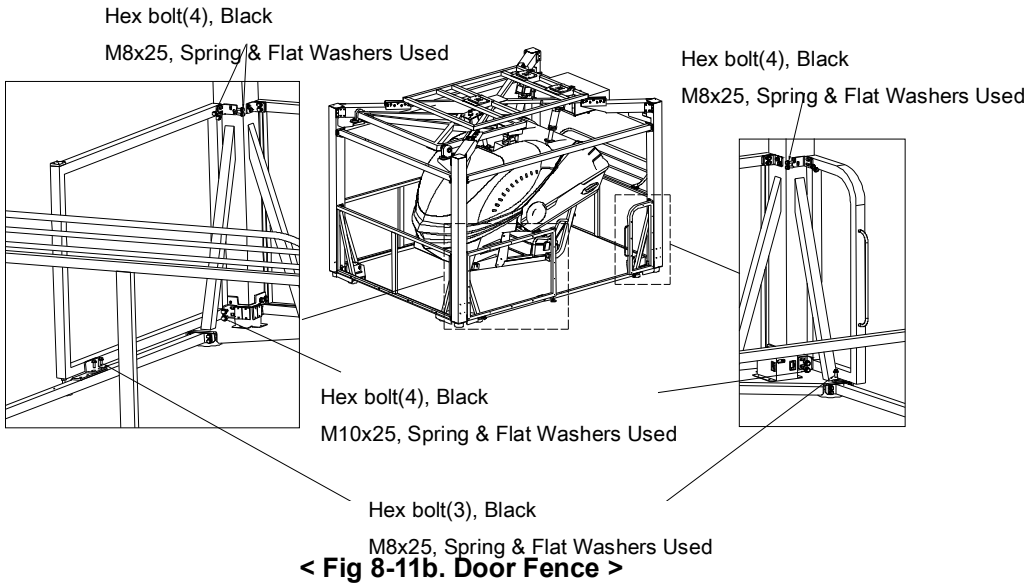
(11) Door Fence and Door box

□ Attach M10 Leveler to the door fence.



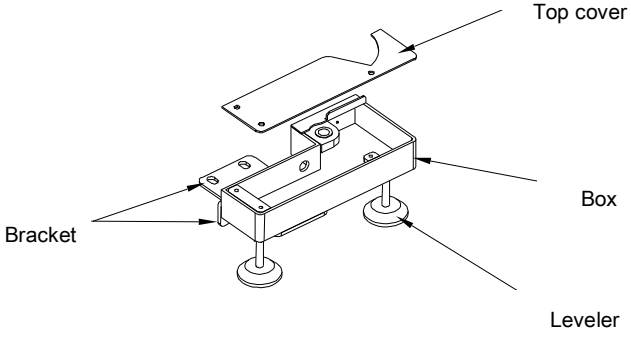
< Fig 8-11a. Door Fence >

□ Attach the Fence bracket on the Door Fence. Attach the fence to the pillar frame.


Hex bolt(4), Black
M8x25, Spring & Flat Washers Used
Hex bolt(4), Black
M8x25, Spring & Flat Washers Used
Hex bolt(4), Black
M10x25, Spring & Flat Washers Used
Hex bolt(3), Black
M8x25, Spring & Flat Washers Used

< Fig 8-11b. Door Fence >

□ Place a bracket between Fence and Door support frame and attach the Door box.

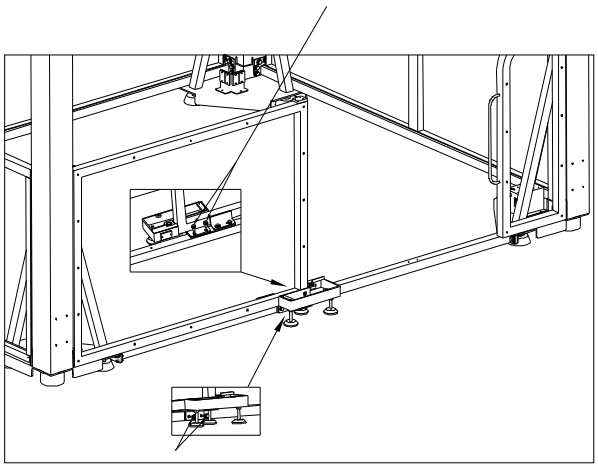


< Fig 8-11c. Door System Box>

□ Attach the levelers to the door box before installing.(Adjust the height after installing the door.)

⑤ Tighten the bolts on the side first. Tighten the bolts on the top at the last.

Hex bolt(2), Black
M8x25, Spring & Flat Washers Used

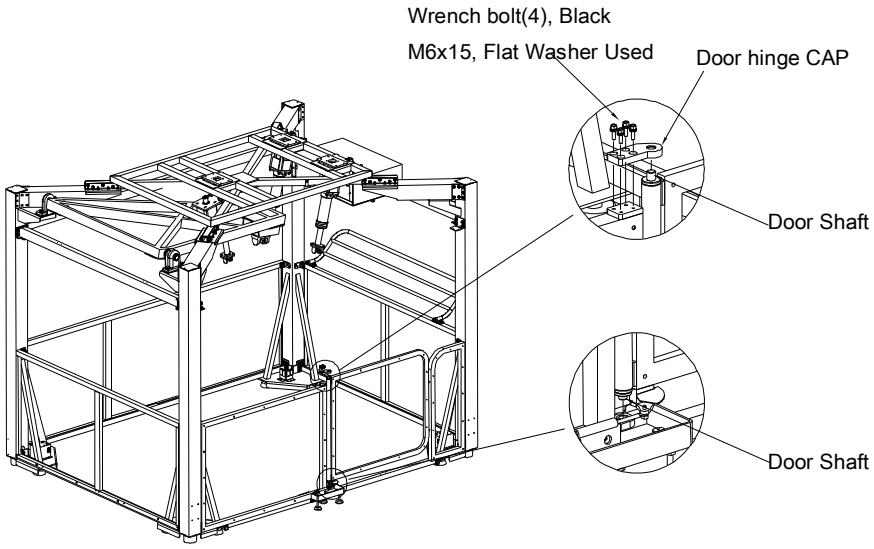


Hex bolt(2), Black

M8x25, Spring & Flat Washers Used

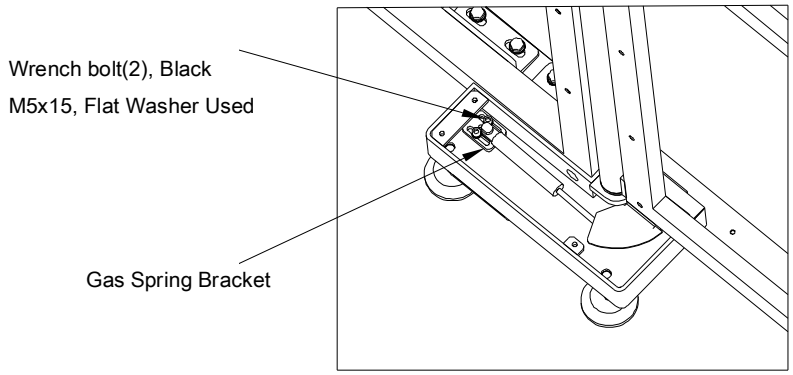
< Fig 8-11d>

- Insert the door shaft to the shaft hole in the Door box.
- Line up the door hinge cap to the shaft and tighten with M6 wrench bolt.



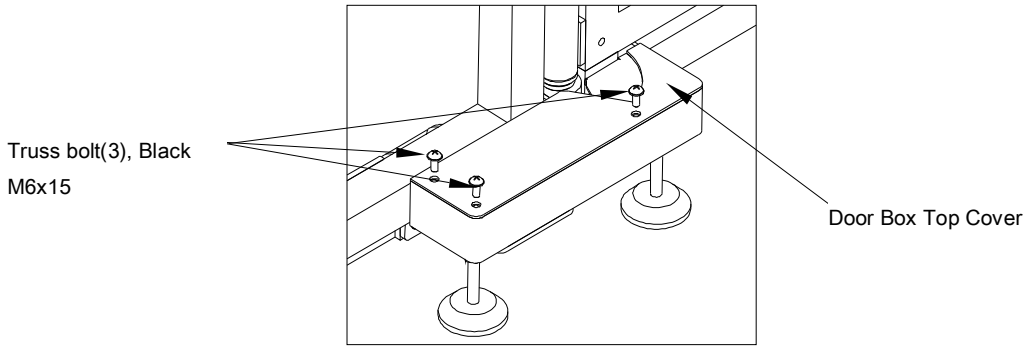
< Fig 8-11e>

- Attach the Gas spring (re-assembled) to the door box.
- Do this with the door closed all the way.



< Fig 8-11f>

□ Close the Door Box Top Cover and secure it with M6 Truss bolt.



< Fig 8-11g>

□ Adjust the height with levelers.

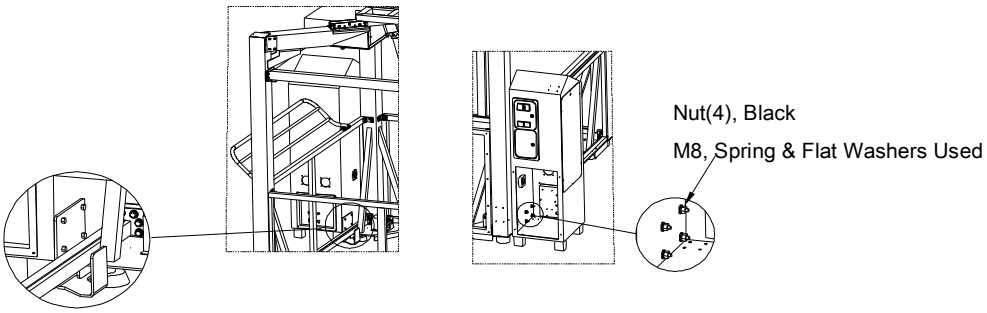
(12) Area Sensor & Setting

Sensors are pre-installed. If any of them should be removed, refer to Ch.15(Area Sensor) to re-install.

(13) SCU

□ Line up the bolt holes on the SCU and the holes on the Pillar frame.

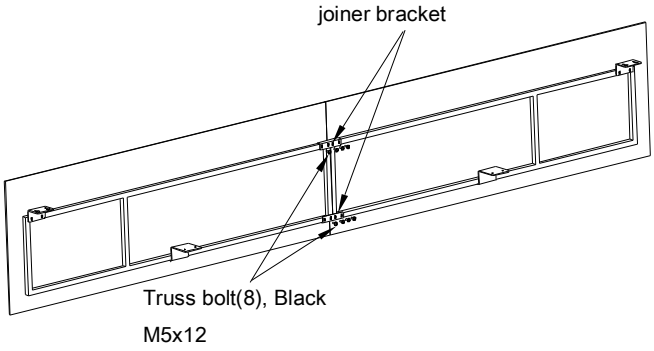
⑥ Nuts are fastened from inside of the SCU.
- Caution! : SCU may tip over and cause damage or injuries if too much pressure is applied. It is recommended that one person should hold on to SCU as the other secures the bolts.



< Fig 8-13a. SCU >

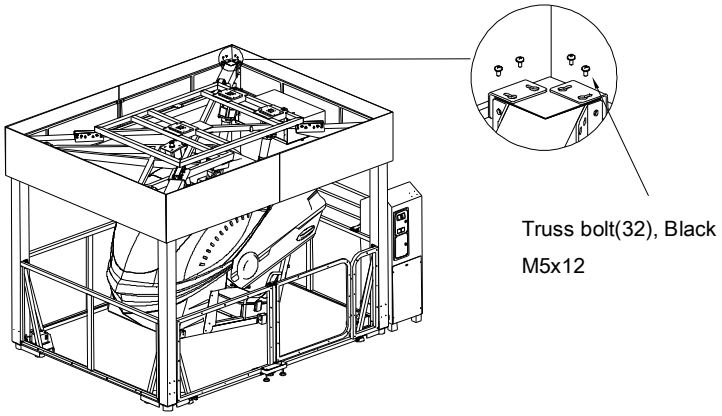
(14) Top Sign Board

 there are 2 kinds of the Top Sign Board. One is in two pieces and the other is in one piece. Each are 2sets.
 Join the two-piece board with a joiner bracket.



< Fig 8-14a >

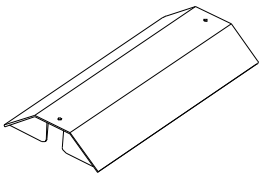
⑦ Attach the Top Sign Board to the Support frame using the Truss bolts.
- Caution! If not careful, Top Sign Board may fall and cause injuries or damages. This may require more than 1 person.



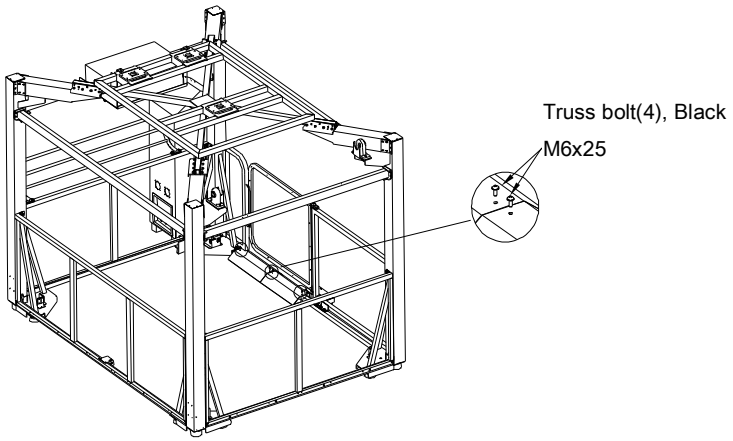
< Fig 8-14b >

(15) Step

 Attach the step to the Door Support Frame and fasten with truss bolts.



< Fig 8-15a >



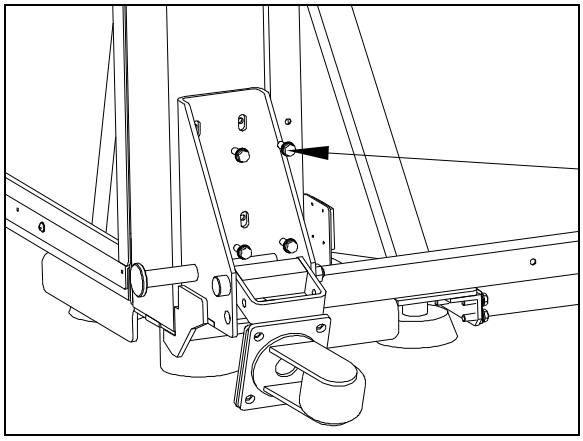
< Fig 8-15b >

Installing Caster – Optional use at the site.

Option Caster is sold separately in case a user requests in order for easy movement within the shop by caster without disassembling the frames

■ Installing Caster

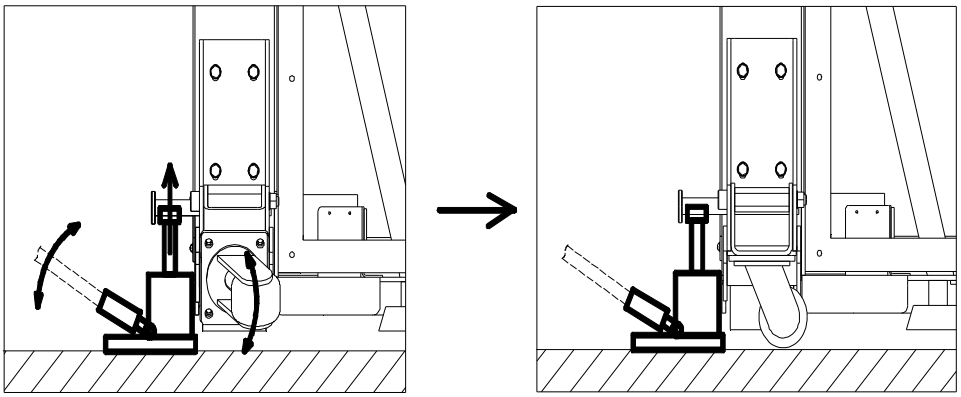
 Place the Caster Set on the Pillar Frame and tighten with M8 bolts.



Hex bolt(8), Black
M8x25, Spring & Flat Washers Used

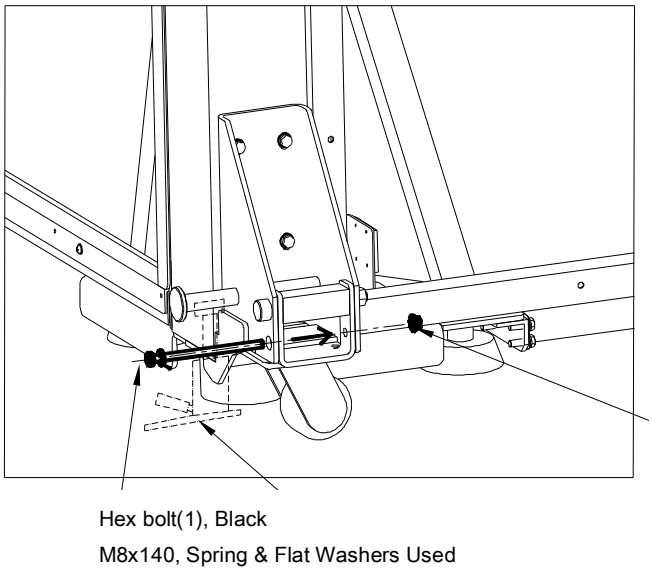
< Fig 1>

- Lift the Pillar frame up by about 60cm from the floor by using hydraulic pressure jockey or manual jockey.
- Lower the caster of the Caster Set



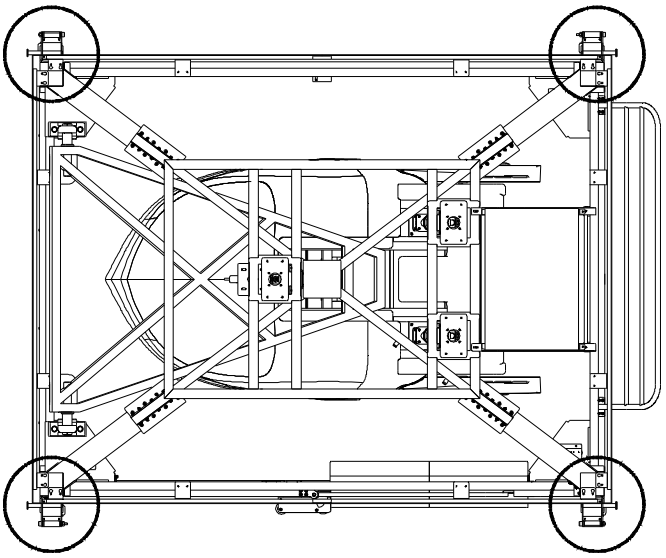
< Fig 2>

- Put the fixation bolt in the fixation hole of the Caster Set and then tighten with nut.



< Fig 3>

 Release the pressure jockey to lower the Pillar frame. So the Casters are grounded.



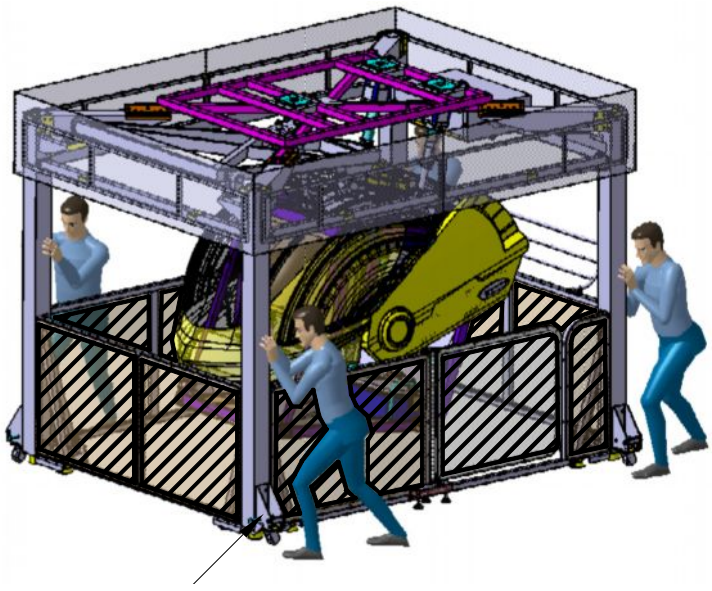
< Fig 4. Position of Caster Set>

9. Precaution of moving system at the location

The system consists of precision machinery and electronics. Be sure to handle with care.

- **Please pay attention to make the product level to the ground or loading container. Failure to heed this precaution may result in the mishandling of the product and cause faulty operation or damage to the product.**
- **Please follow the below precautions at the site. If ignored, this will cause the parts damage or damage to the floor.**

  - **Transport the product on a flat floor.**
  - **On a slant area with 1cm or more, use a ramp.**
  - **Transport the product at a speed of less than 2km/h**
  - **Do not tilt too much. Be careful not to apply the load to only one side.**



< Fig 9. Precaution of transport>

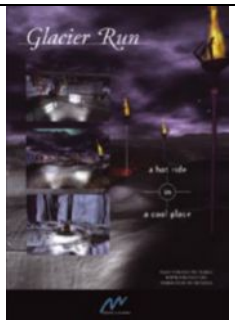
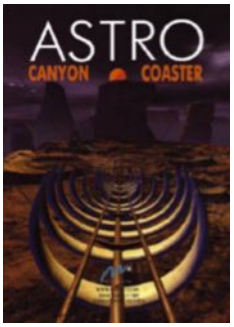
10. Description of Safety devices

NO	Name of Item	Image	Location	Description
1	**Area Sensor**		The bottom of Pillar Frame (5 pcs)	If the sensor detects an interruption of obstacles in the area, it will stop motion and resume the motion after the obstacles are removed.
2	**Emergency Stop Button**		Inside the cabin	Pressing this button will stop the motion at any time during a ride. The cabin will be moved into the standby position.
3	**Door Sensor**		On the door	It detects door open. In case the door opens, it stops the cabin's motion, and resume the motion 3 seconds after the door is re-closed.
4	**Cabin Sensor**		Outside the cabin (2 pcs)	Detecting this sensor will stop the motion. After the obstacles are removed, it will resume the motion after 3 seconds. This will keep passenger's legs inside the cabin.
54	**Seatbelt**		Inside the cabin	The seatbelt contains sensor which detects whether it is fastened or not. The ride will not start if the belt is not fastened and will stop the motion if the belt is unfastened during a ride. In such a case, the ride will resume 3 seconds after the belt is fastened again.
65	**Safety fence**		Around the cabin	It maintains an appropriate distance between the waiting guest and the moving cabin. It also discourages the guests from unnecessarily stopping the motion during a ride by approaching the cabin too closely.

11. Description of Rides

■ ABOUT THE RIDE

Mini-Rider 2 includes 4 rides and passenger can choose one ride from the rides.

Title	Image	Content
Haunted_Mine		Hang on to your ten-gallon hats as you plunge Headfirst into an old, dilapidated gold mine that just happens to be haunted… Inside this hotbed of mystery and suspense you'll come face to face with the mine's ghostly prospector who'll warn you not to venture further – but your insatiable appetite for adventure will disagree! Only your quick thinking (and a little luck) can get you out alive.
Glacier Run		A white-knuckle experience with dazzling imagery. This nonstop action ride (a cross between a bobsled and a roller coaster), designed to make your senses erupt, will take you to the frozen landscapes of the Arctic during the Northern Lights season.
Astro Canyon		Hold on for a wild ride in a Grand Canyon-like environment in outer space.
Cosmic Race		Fasten your seat belt and get ready for the race. Futuristic race will surely give you the experience you'd never had before.

12. Ride Operation Instruction

1. Make sure the cabin is initialized before boarding.

2. Make sure that one of the passengers is on the right side of the seat before boarding the other. Be sure that both of the passengers do not exceed 240kg.
"Caution" When children are boarding, make sure the child is on the right side of the seat.

3. Fasten the seat belt and make sure the belts are secure after boarding.
"Caution" The machine will not run if the seat belts are not secured.
4. [Insert Coin(s)] will show up on the screen. – Ride start screen -

<Ride start screen>

5. Insert coins.

6. At the ride selection screen, choose one movie from 4 of the movies. You can do this by pressing the selection buttons bellow the display.

<Ride selection screen>

<Select button>

7. Each film is about 4minutes long.

8. When the film is finished, ride start screen will show up and the cabin will move to the initial position.
When the cabin stops and the massage on the screen show up, you may un-fasten the seat belt and get off the ride.

"Caution" Do not un-fasten the seat belt until the cabin is at the initial position.

Please take your time to read this massage.

****

[Warning]

■ Please turn on and turn off individually. Never cut off the power by switching off the breaker. Follow this manual at all time.

■ When cutting the power off to the MCU, make sure no one is on-board the machine. It may drop suddenly and this may cause an accidents.

■ Do not switch on and off continuously. When you turn off the machine, wait at least 1 min before you switch it on again. If not, Digital Motion controller may be damaged.

■ 220V DC power is flowing through out the cabin. Servicemen should be certified engineers. Do not disassemble without Simuline's consent.

■ MCU and SCU may not be disassembled by an unauthorized personnel.

****

13. SYSTEM ON

13-1. System ON (POWER ON)

 Turn on the mains input power switch at the rear side of SCU ensuring that 230 single phase power is connected.

 System will boot up. In normal manner, it will take about 3~4 minutes. The cabin monitor will show boot-up process and when it finished, control program will be executed. When the system control program executed, apply the power to the MCU (motion control unit), and then make the cabin move into the initial position. When the monitor displays attract mode, a start-up process is done and it is ready for a ride.

< Attract Mode>

13-2. System OFF (Power OFF)

Powering off should be followed as described in the manual.

 Press and hold the System Off button for 2 seconds at the rear of the SCU. Pressing this button will make the cabin move into initial boarding position and then cut the power to the MCU by making the breaker off sound. Then, the control computer will shut off.

 Turn off the Mains input switch at the rear of SCU

13-3. Emergency Situation

There are two ways to stop the operation for safety reasons. One is ‘Emergency Stop Button’ and the other is ‘Power Cutoff Switch’
In case the ‘Emergency Stop button’ does not work, stop the operation by pressing the ‘Power Cutoff switch’ located at the rear of SCU.

- **Be sure to stop the operation by pressing [EMERGENCY STOP BUTTON] and in case of failure with this button, use [POWER CUTOFF SWITCH]**

■ [EMERGENCY STOP BUTTON]

Press this button in case of the following emergency situations during a ride.;

- Passenger looks uncomfortable
- In case of any abnormality of the motion
- In case any abnormality situation in the environment occurs, and press this button will make the cabin move into the initial boarding position and display of the monitor will return to attract mode screen.

■ [POWER CUTOFF SWITCH]

In normal operation, press the Emergency Stop button if any emergency situation occurs. Power Cutoff switch should be used in case the Emergency Stop button does not work within 5~10 seconds even after the button is pressed.

- **Do not press POWER CUT OFF BUTTON if anyone or any article is below the**
- **cabin. The cabin will slowly move down and can injure or damage any person or**
- **article under the cabin.**

14. MONITOR

14-1. HANDLING CAUTION OF MONITOR

Before handling the monitor, read the following instructions carefully and follow the cautions below.

Indicates important information that, if ignored, may result in the mishandling of the product and the possibility of personal injury or death.

Indicates a particular location of the product that is not to be touched.

Indicates important information that, if ignored, may result in the mishandling of the product and the possibility of personal injury, and/or may result in equipment damage.

Indicates that the power connector or the power plug needs to be disconnected.

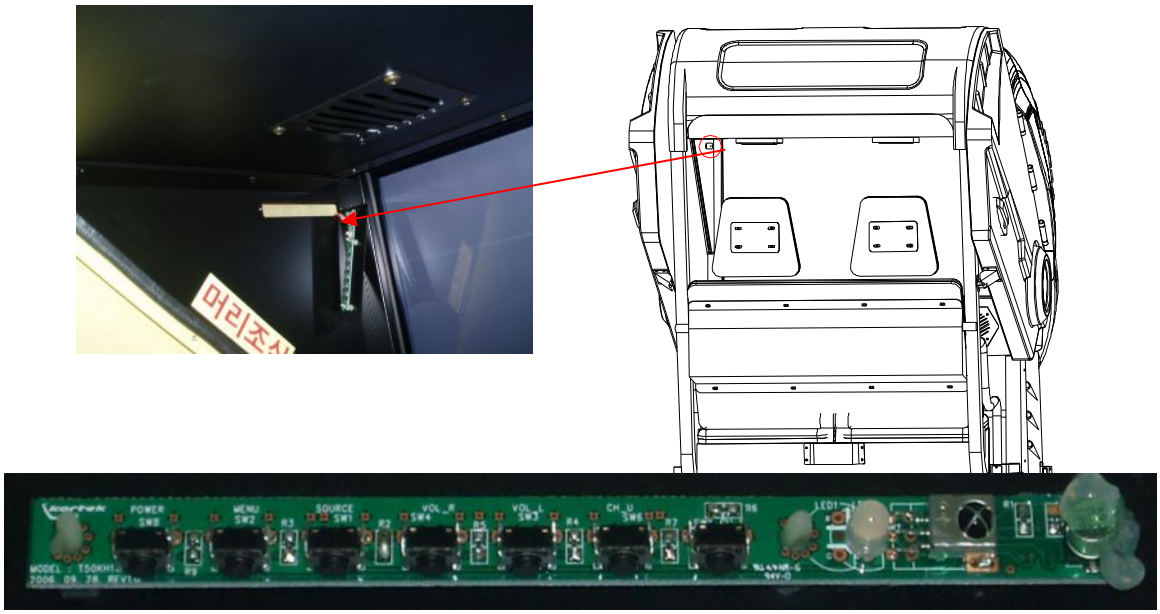
- Be sure to unplug the power cord first when installing/uninstalling the monitor or disconnecting any external connector connected to the monitor or the internal parts of the monitor. Working with the power on may result in electrical shock or other accidents.
- Do not modify the monitor without permission. The company is not responsible for any trouble or accidents caused by unauthorized modifications.
- Primary side and Secondary side
  The monitor circuit is divided into the primary and secondary sides which are electrically insulated. Do not touch the primary side or both the primary and secondary sides simultaneously. Doing so may result in electric shock. When adjusting the device, use a non-conductive screwdriver and do not touch any other parts except for the handle. Do not short-circuit the primary and secondary sides. It may cause an electric shock or malfunction.
- High Voltage
  Since the monitor contains parts that generate voltages higher than 20,000 volts, do not touch the inside. If a piece of metal or paper is falls into the monitor, immediately turn the power off. Failure to do so may result in a malfunction or a fire.

14-2. ADJUSTING MONITOR

- Since the monitor is fully adjusted when it is delivered, any other adjustments are unnecessary. Handling the monitor, which contains high voltage components, is very dangerous.
  In addition, a wrong adjustment may cause breakdown due to a bad screen or unfixed synchronization.
- Monitor (projector) should be appropriately adjusted. If a defect such as flashing is detected on the screen, do not leave it without adjustment. An Inappropriately adjusted screen may cause dizziness, headache, or other physical injury to customers.
- Do not touch any unspecified parts. Failure to comply can result in electric shock or short-circuit.

Check the position of the monitor controller. It is located at the left of the monitor.

Monitor Controller

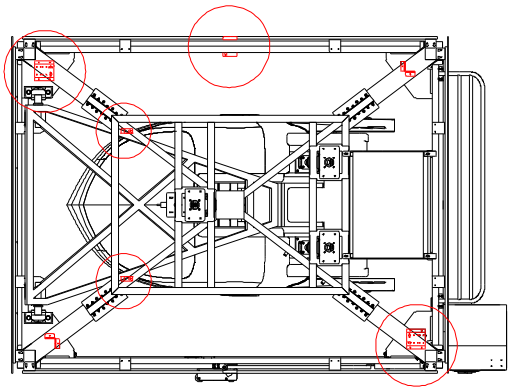


■ BRIGHTNESS : ADJUST SCREEN BRIGHTNESS.
■ CONTRAST : ADJUST SCREEN CONTRAST.
■ SHARPNESS : ADJUST SCREEN SHARPNESS.
■ H-POSITION : ADJUST HORIZONTAL POSITION.
■ V-POSITION : ADJUST VERTICAL POSITION.
■ PHASE : ADJUST SCREEN CLOCK PHASE.
■ FREQUENCY : ADJUST SCREEN FREQUENCY.

15. Area Sensor

Carry out the following procedure in case the area sensor does not work properly. The LEDs on the sensor indicates the status.

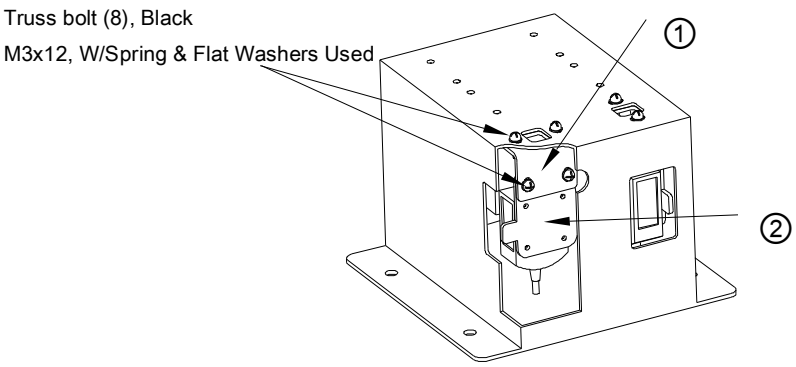
① Area Sensor consists of Reflector and Sensor. If the adjustment is needed, adjust the sensors located as shown in the figure below.



< Fig 15a>

② Slightly loosen the truss bolt to adjust the sensor.

③ The sensor is adjusted by □,□.



< Fig 15b>

□ The sensor is adjusted by pointing the sensor in the direction of the centre of reflector. In this case, you can put a white paper in between the sensor and reflector to see if the beam is aligned correctly.

□ If yellow LED lights up or turned off, verify that nothing is obstructed between the area sensor and reflector and then perform the adjustment again.

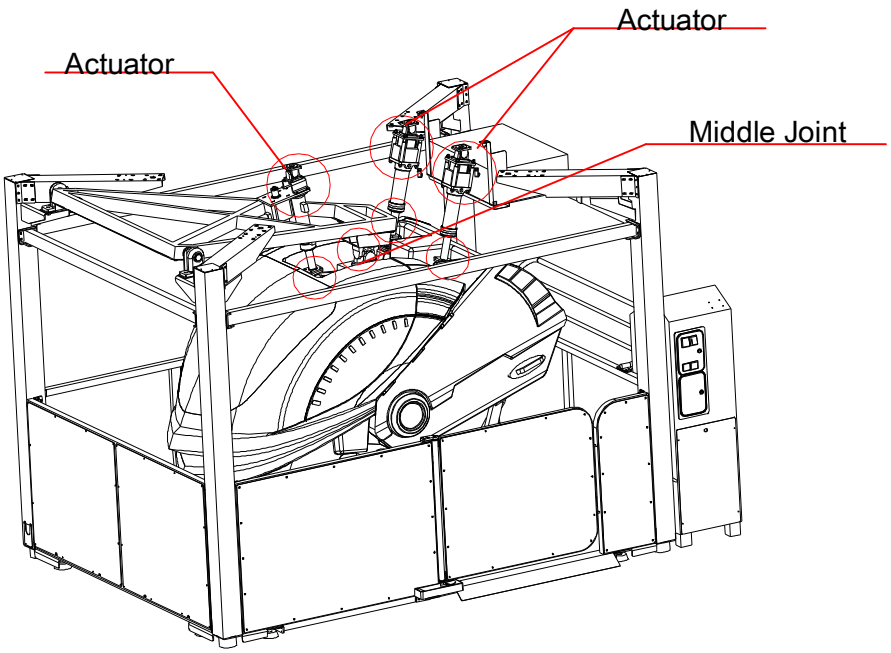
16. Grease Up

• Be sure to use the designated grease. Using undesignated grease can cause parts damage.
• Do not apply grease to locations other than as specified. Doing so may create a risk of operational problems and deterioration of parts.
• The designated periods for greasing serve only as a guide. Whenever there are squeaks or other anomalies, apply grease at designated locations.

Grease UP is required to maintain normal lubricate levels at high/low temperatures and to enhance the durability of the product.

Neglecting periodic Greasing will shorten the life span of the product and may cause strange noises or vibrations.
The actuators and the Middle Joint of Mini Rider #2 must be greased. The product should be greased Twice every year or depending on the operation of the Mini Rider #2.

- Designated Grease : KLUBER HIMONAX WS433



< Fig 16a >

16-1. Actuator Grease Up

- Remove the bellows of the Actuator
- Use the Grease Gun to apply 60g to the Grease Nipple of the actuator (TOP), and 30g to the Bottom part.

< Actuator Top >

< Actuator Bottom >

- Wipe off excess grease.
- Replace the bellows cover into the original position.

16-2. UNIVERSAL JOINT IN THE ACTUATOR

- Remove the bellows cover.
- Apply 5g of Grease to the top and bottom of the Universal Joint in the actuator.

< Universal Joint >

- Wipe off excess grease.
- Replace the bellows cover into the original position.

16-3. Grease Up of Middle Joint

< Middle Joint >

- Apply about 5g of grease to Middle Joint
- Wipe off excess grease.

17. Maintenance

17-1. PERIODIC INSPECTION

• Once a year, check to see if power cords are damaged, the plug is securely Inserted.

• Once a year, request the dealer from whom the product was originally purchased to perform routine maintenance on moving mechanisms. Failure to perform maintenance can lead to accidents.

• There is the danger of accidents involving electrical shorts circuits or fire caused by factors such as the deterioration of insulation in electrical and electronic Equipment over the time. Check that there are no abnormalities such as odors from burning rubber etc.

- **Authorized personnel must perform maintenance works. Be sure to follow the instructions in this manual.**
- **Maintenance works must be performed after the breaker must be turned off. Performing works with applied power may result in abrupt operation of the product or cause electric shock to the body.**

In order to maintain the performance of this product and operate it safely, inspect the following items routinely and perform maintenance.
The player directly touches and manipulates the select button with his/her hands. Clean these buttons as necessary and provide hand towels, etc., so that players will be comfortable while riding.

PERIODIC INSPECTION TABLE

ITEMS	DESCRIPTION	PERIOD
Outer frame	Confirm that the adjuster is level to the ground	Daily
Inside Cabinet	Cleaning	Daily
Monitor	Check screen adjustment	Monthly or when moving
Coin Selector	Coin insertion test Coin Selector cleaning	Monthly Monthly
Electronic parts	Inspection	As appropriate
Power cables	Inspection, cleaning	3 months
Cabinet	Cleaning	Monthly
Cabin Surface	Cleaning	As appropriate
Moving mechanics	Maintenance Grease up	1 year 1 year

Safety equipment	Seatbelt Motion Stop button Area Sensor Cabin Sensor Door sensor Safety fence	Daily Daily Daily Daily Daily Daily

Cleaning the Cabinet surface

When the cabinet surfaces become dirty, remove stains with a soft cloth soaked in water or diluted (with water) chemical detergent and then dry area ASAP. To avoid damaging to the surface, do not use such solvents as thinner, benzene, etc. or abrasives (bleaching agent and chemical dust-cloth). Some general-purpose household, kitchen, and furniture cleaning products may contain strong solvents that degrade plastic parts, coatings, and print. Before using any cleaning product, read the products cautionary notes carefully and test the product first on a small area that is not highly visible.

18. Troubleshooting

18-1. Troubleshooting table

problems	Cause	countermeasure
Failure of power on	Circuit breaker of the AC unit is no in operation	Connect the AC 230V.
	Plugs are not connected	Plug the 230V to the cabinet in outlet.
	Mains switch of the SCU is off	Turn on the mains input switch
System is not operational	Check the error message on the cabinet message	Follow the emergency stop sequence by turning off the power. Wait for about 1 minute and switch on again. If it does not work, contact the service representative listed in this manual.
Cabinet does not operate	Confirm that the door is closed.	Close the door
	Area sensor is interrupted (YELLOW LED OFF)	Remove the obstacles (YELLOW LED ON)
	Sensor is not aligned	Align the sensors
Failure to power off	Malfunction of system	Turn off all the powers in the sequence of Emergency Stop

18-2. MCU Error

Next is a list of Error Codes regarding the Motion Control Board Malfunction. Please check the error codes when an error occurs.

■ **MCU Error Message**

Error Code	Cause	Countermeasures
FFOO	Encoder connector at the Motor Drive Board is Unplugged. (J11)	[Check the Encoder Connector] Check the connection of encoder connector at the Motor Drive Board and MCU. Check for any damages.(J11)
FFFF FFC7	Motor Drive Board did not receive signal from encoder After the power is switched on.	[Check 5V SMPS output] 1.Check the voltage between GND and + 5V is within the range of DC5.0V~5.2V. 2. If 1. Checks out OK, and the problem repeats, contact the service representative listed in this manual.
F800	Motor Drive Board (K5,K8) +12V relay at the input power Is disconnected.	Check if the power unit Motor Drive Board input power SMPS +12V is normal. If SMPS +12V power is normal, check the Motor Drive BD J7 Connector +12V power with a tester. When

		the +12V power is not available, check the connection harness.
FFFE	Actuator Limit Sensor is not Responding.	1. Check the connection/installation of Actuator Limit Sensor. 2. If 1. checks out OK, and the particular Motor Drive BD repeats FFFE Error, contact service representative listed in this manual and replace the applied BD.
90AE 9086	Error at the #1,2,3 Actuators When the power is supplied. (Motor Encoder was supplied with power and the motor could not find the phase Information. In result, motor could not find Z pulse.	1. This may happen when the machine was started in a slanted position. Restart the system. 2. Actuator Limit Sensor (Bottom Sensor) installation is not in order..
8C3	Motor Drive BD “IPM” Error	1. Check the AC power to the Motor Drive BD stays in the range of AC200V~AC230V. 2. Check the operation of the fan at the Motor Drive BD Heat sink. 3. 1,2 checks out and particular motor drive BD repeats the same error, contact service representative listed in this manual and replace the applied BD.
10C3 90C3	Over current Protection Error	1. Check to see if the output voltage of the Main Transformer (220R, 220T) stays within the range of 210V~230V. 2. Insufficient Actuator lubing may cause this error. Check the Actuator for lubing, and apply lubing when needed. 3. 1,2 checks out and particular motor drive BD repeats the same error, contact service representative listed in this manual and replace the applied BD.
40C3 DOC3	Over voltage protection error	1. Check to see if the output voltage of the Main Transformer (220R, 220T) stays within the range of 210V~230V. 2. Check the input power source. Check if there’s a possibility of Temporary voltage over 240V. 3. 1,2 checks out and particular motor drive BD repeats the same error, contact service representative listed in this manual and replace the applied BD.